In 3 Parts—Part One No. 5

CHEMICAL INDUSTRIES

The Chemical Business Magazine

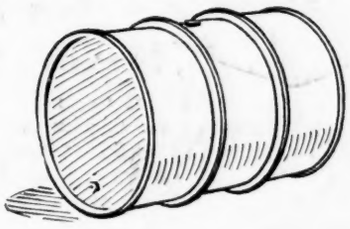
3 out of 5 raw materials unavailable... yet delivery was made on schedule!

One of a series of cases from the files of Monsanto's Technical Service Department which show how skill, experience and ingenuity can solve many critical wartime problems. For obvious reasons identifying names and any clue have been omitted.

1. The order read—"Must have delivery in three weeks!" or work will stop on a vital construction job!

But of five chemical raw materials required to manufacture the particular product called for — *three had been drafted for defense!*

There seemed nothing else to do but write the customer, "Sorry! We can't supply etc., etc." Certainly such a letter is no novelty these priority-troubled days.



2. Monsanto sales correspondents, however, are often deliberately *slow* on the trigger.

Before the sales department mailed its regrets, they put Monsanto's able Technical Service Department to work on the problem.

In the specified three weeks, adequate replacements for all three unavailable materials had been found and thoroughly tested—*and the order was in the customer's receiving room!*

3. Obviously not all the problems created by the present emergency can be so quickly and happily solved. But two factors often give Monsanto technical men an invaluable head start toward a solution . . . a thorough understanding of *your* problems and basic processes . . . and, equally important, a broad knowledge of their *own* business which springs from the very breadth and variety of Monsanto's chemical manufacturing experience.

UNIFORMITY — STILL AN ESSENTIAL

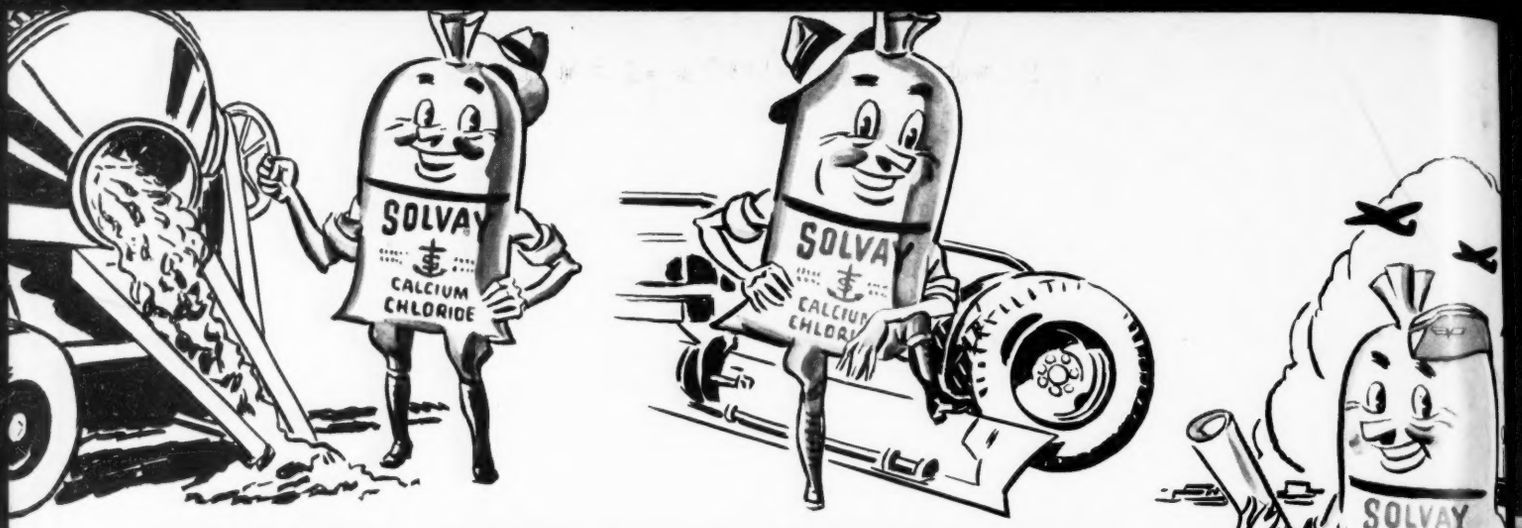
No matter how great the pressure for more and more production, in nearly every chemical used by industry, in war as in peace, *uniform* quality is still essential in *every* shipment.

That's why *every* batch of *every* Monsanto chemical, in wartime as in peacetime, is carefully controlled at *every* step in its manufacture... and *every* batch is *double-checked* in the control laboratory before it leaves Monsanto's plant for yours. MONSANTO CHEMICAL COMPANY, St. Louis, U.S.A.

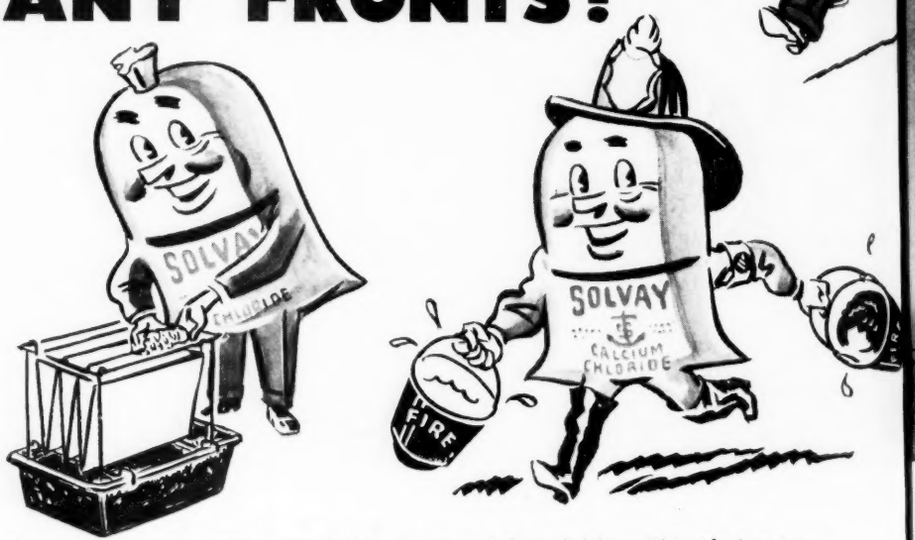
MONSANTO CHEMICALS

SERVING INDUSTRY...WHICH SERVES MANKIND

"E" for Excellence . . . the pennant denoting the highest service accomplishments in the United States Navy . . . flies with the Naval Ordnance flag over Monsanto. In the words of the Secretary of the Navy, this award has been made to Monsanto "in recognition of your outstanding efforts in the production of ordnance materiel vital to our national defense."



THESE WAR WORKERS ARE ON MANY FRONTS!



Solvay Calcium Chloride, which has many unique peace time applications in industry and public works, has shown itself to be no less versatile in aiding the Victory Program. Among these uses of Solvay Calcium Chloride for defense of the Nation are:

RAPIDLY BUILT, HEAVY SERVICE ROADS are now in use at Army camps, arsenals, war production plants. These quickly built dustless roads, constructed in accordance with calcium chloride stabilization specifications, are carrying great volumes of both light and heavy traffic.

SPEED-UP IN CONCRETE CONSTRUCTION Solvay Calcium Chloride is saving precious time in the building of both Army and Navy roads and structures and those erected for the production of war materials. It cuts concreting time in half by accelerating development of strength and protecting concrete in cold weather, at the same time increasing ultimate strength.

DUSTLAYING AND SURFACE BINDING—One of Solvay Calcium Chloride's important war time jobs is that of keeping down dust and binding the surface of unpaved areas at Army camps, arsenals and industrial plants. This is the clean, odorless method of dustproofing camp streets, recreation fields, parade grounds, areas adjacent to mess halls and parking spaces. This treatment also prevents dust damage to precision machinery and finished goods at industrial plants.

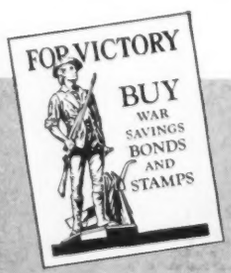
BASES FOR AIRPORTS—Today's huge bombers with their tremendous weights and high speeds require surfaces and bases which "can take it." The Calcium Chloride Graded Aggregate Base provides the structural strength and stability which today's airport surfaces require, in addition, offering definite protection against frost action.

FOOD PRESERVATION—Solvay Calcium Chloride is not only helping to preserve food supplies of Army, Navy and civilian groups, but it is also helping to preserve refrigeration equipment—a vital factor today when metal and machinery are so precious. Solvay Calcium Chloride has long been known as the low temperature, corrosionless brine medium.

AIR DRYING—Solvay Calcium Chloride and Solvay Air-Dryettes are today at work in many Government and industrial storage rooms and vaults pulling excessive moisture from the air . . . protecting valuable records, equipment and supplies from condensation, humidity, rust, mildew and other forms of dampness damage.

SOLVAY CALCIUM CHLORIDE IS ALSO USED IN THE VICTORY PROGRAM FOR: preventing freezing, fouling of solutions in fire pails and barrels; for freeze prevention of iron ore, coal, coke, stone, gravel, cinders, sub-grades; for skidproofing icy highways in winter.

For full information on any of the above uses of Solvay Calcium Chloride write to:



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TRADE MARK REG. U.S.

More of What it Takes to

"KEEP 'EM FLYING"

To meet aviation-grade specifications, lubricating oil must be decolorized to remove carbon-forming color bodies . . . a process that can become the bottleneck of the refinery. Now MAGNESOL . . . a synthetic adsorptive magnesium silicate...is successfully increasing the output of refinery decolorizing facilities.

Also used in dry-cleaning solvents to remove soluble impurities by adsorption, Magnesol may have applications in the chemical industry wherever a highly-efficient adsorbent agent is required. A recent 60% increase in Magnesol production facilities assures an ample supply.

(Magnesol T. M. Reg. U.S. Pat. Off.)

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Division of WESTVACO CHLORINE PRODUCTS CORPORATION

CHRYSLER BUILDING, NEW YORK, N. Y.

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The Business Magazine for Makers & Users of Chemicals

Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

Volume 50 — Number 5

MAY, 1942

Contents

Editorials 609

Feature Articles

Lime as a Chemical Raw Material — By Wallace E. Wing 612
The American Balance Sheet in Oils and Fats (Part II) — By Walter J. Murphy 618

New Chemicals for Industry

Chemists at War—Report of the 103rd Meeting of the American Chemical Society. A Staff Report 636
New Products and Processes 641
Laboratory Notebook 642
Industry's Bookshelf 642

Plant Operation and Management

Packaging Chemicals and Specialties in War-Time — By Paul B. Slawter, Jr. 644
New Equipment 649
Packaging and Container Forum — By R. W. Lahey 651
Plant Operation Notebook 654

Chemical Specialties

Boiler Compounds and Boiler Water Conditioning — By Benjamin Levitt 656

News of the Month in Review

Washington — By T. N. Sandifer 586
Chemogram (Digest of Last Minute News) — Insert facing 594-5
General News 667
Chemical News in Pictures 627, 659
Between the Lines—Fluorspar 674
Canadian Review — By Kenneth R. Wilson 675
Chemical Specialty News 676
Booklets and Catalogs 701
Review of the Markets — By Paul B. Slawter, Jr. 678
Prices Current 684

Part 2: Statistical and Technical Data Section

Current Statistics—Business Trends 707
Chemical Stocks and Bonds—Chemical Finance 709
Trademarks 711
Government Regulations on Materials and Prices 713
U. S. Patents, Foreign Patents 715

(Index to Advertisements . . . Page 705)

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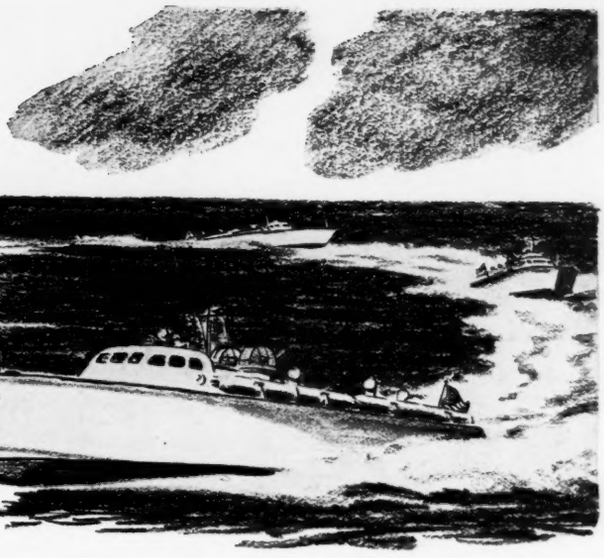
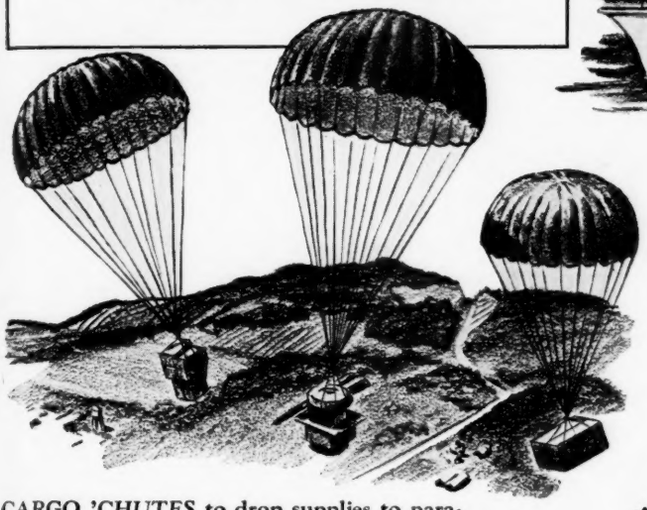


"PT" BOATS clip the waves at 70 miles per hour! Speed is their chief defense. If their powerful engines fail in battle—they are dead ducks! To assure trouble-free timing, ignition systems are insulated with phenolic resins—the best non-conductor yet devised. In the synthesis of phenol by the sulfonation process, caustic soda is an essential raw material.



CARGO 'CHUTES to drop supplies to paratroops or isolated garrisons are now being made of rayon. Although still in the experimental stage, rayon promises to replace other fabrics which are needed for parachutes that carry human cargoes. Largest U.S. user of caustic soda, the rayon industry produces rayon cord for tires...high-tenacity fabric for self-sealing gasoline tanks.

BIG GUNS that can tear a tank to shreds ride on tires that are part new, part reclaimed rubber. In reclaiming rubber from used tires, caustic soda is used to dissolve the cord fabric, thus separating it from the rubber which is to be reworked.

UNCLE SAM'S "Battlewagons" pack a lethal wallop with their bristling batteries of 16-inch rifles. Breeches are loaded with smokeless powder neatly stitched in silk bags. In the manufacture of smokeless powder, caustic soda is used to purify the cotton linters.

TORPEDO PLANES are poison to enemy warships. Whether based on land or sea-roving carriers, U.S. warplanes burn staggering quantities of lubricants and high octane gasoline. In replenishing vital supplies of fuel, oil refineries employ caustic soda to remove objectionable sulphur compounds from petroleum products.

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THE MATHIESON ALKALI WORKS, (INC.)

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LIQUID CHLORINE . . . SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . BLEACHING POWDER . . . HTH PRODUCTS . . . AMMONIA, ANHYDROUS and AQUA . . . FUSED ALKALI PRODUCTS . . . SYNTHETIC SALT CAKE . . . DRY ICE . . . CARBONIC GAS . . . SODIUM CHLORITE PRODUCTS

THE READER WRITES

Professional Status

I am enclosing a copy of the March number of "The Journal of the Engineers' Club of St. Louis" containing some articles on the subject of "Unionization of Professional Men."

We believe this to be an issue of far reaching significance for the professions as well as the industries and it is our intention to keep our membership posted through the Journal in regard to developments in this matter.

We felt that your editorial in the October, 1941 issue entitled "The Threat to Professional Status" was a fine article to get this discussion started and took the liberty of reproducing it in our Journal.

JULES BEBIE,
Consulting Chemical Engineer,
St. Louis, Mo.

War Regulations

I am very glad to note you are including in your Statistical and Technical Data Section of CHEMICAL INDUSTRIES the Government regulations on priorities, etc. I take it that these would be 100 per cent. coverage, by that I mean any commodities or orders appertaining to the chemical industry issued by the war time Boards of Control will, without doubt, be included in this section. Am I correct in this?

Indeed I wish to commend CHEMICAL INDUSTRIES for this S. & T. Data Section, as to me it has been most useful and this latest inclusion, I know others as well as myself will appreciate.

W. BURNS LOGAN,
Consulting Chemical Engineer,
Green Acres,
Lake Charles, La.

The Geer Rubber Article

In the January 1942 number of your journal, CHEMICAL INDUSTRIES, there is an article by Dr. W. C. Geer on "Elastomers in the Nation's War Programme," containing two charts on page 28, which I should like to refer to and copy in part in a brief article on synthetic rubber that I am writing for the Engineering Institute of Canada journal.

I might add that we are subscribers to CHEMICAL INDUSTRIES, and always enjoy reading articles, such as this one by Dr. Geer, which appear in almost every issue of your journal.

R. S. JANA,
Research & Development Dept.,
Shawinigan Chemicals, Ltd.
Montreal, Canada.

Again War Regulations

Would you kindly advise us if you have any extra copies of Vol. 50; Part 2 of February. We would very much like to obtain four copies of this Statistical and Technical Data Section as it contains an excellent Summary of War Regulations.

W. H. BIRCHARD,
Fraser Companies, Ltd.,
Edmundston, N. B.,
Canada.

India Likes Us.

With reference to your circular letter of the 1st September, 1941, I have pleasure in complimenting you upon the series of articles presented in the various issues which are most constructive, possessing a reader confidence which is a business insurance. Like rare wine it has improved with age and always kept a pace ahead of the progress in its industry rendering a real service to its readers and advertisers. For a magazine to continue to grow and prosper over such a period, it is, certainly, a high endorsement of the quality of its production and business integrity. "Age begets Prestige" and its increasing age has given it the "Spring of Youth" and, as far as I know, it stands singly and alone as the representative and authoritative medium in the Chemical Industrial Field. Indeed, this success should be largely due to your steadfast policy of giving to your readers everything worthwhile, and thus beyond competition in giving news of the Industry while it is News. On the whole it is a publication of honour and standing in its field.

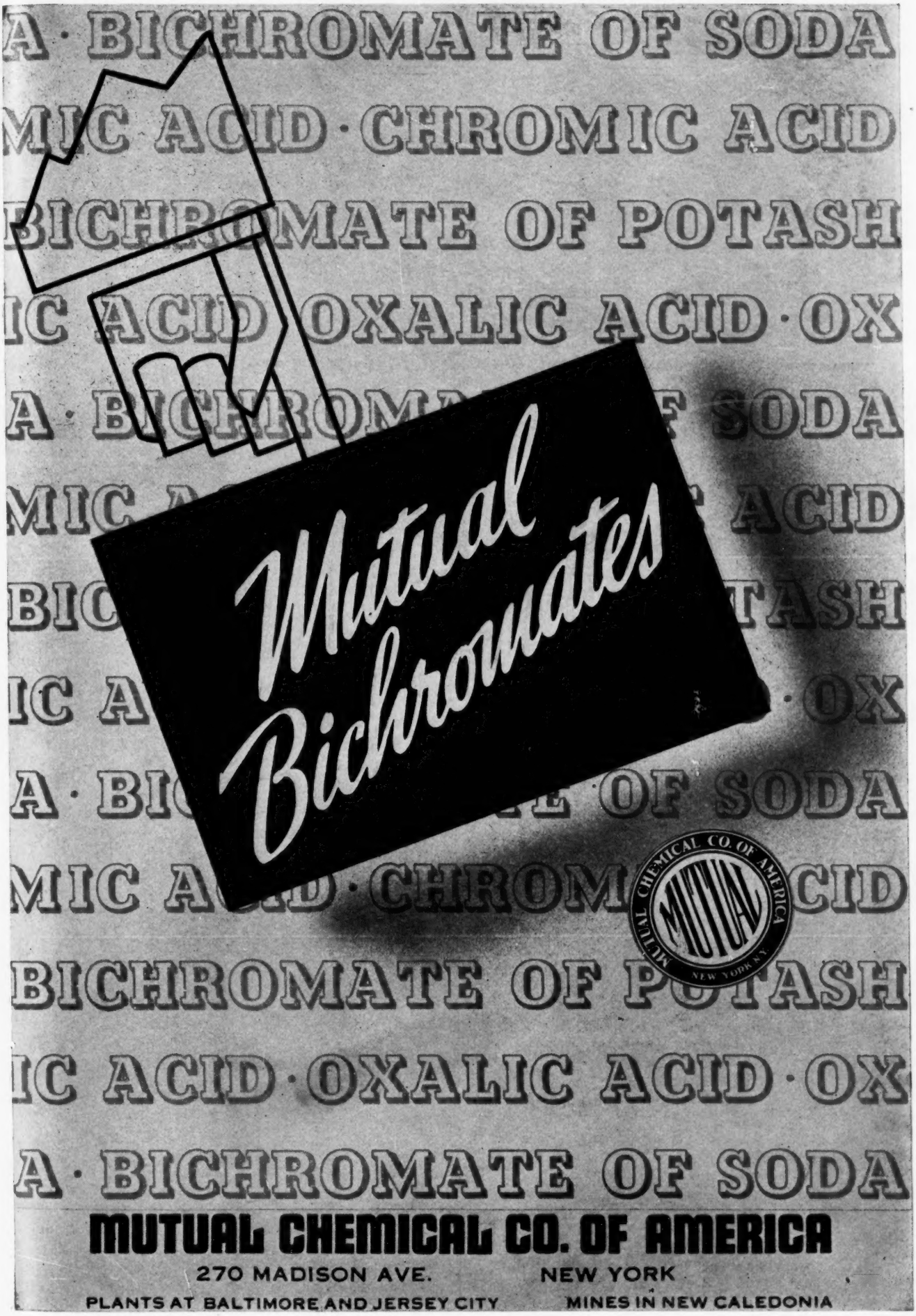
As regards the Buyer's Guide Book, it is practically a statistical analysis of the Chemical Industries Market of the U.S.A. It has a ready-reference value, a great fund of information gathered at considerable expense and care, combining as it does, in one handy volume, information frequently needed, carefully recorded, systematically arranged, corrected up-to-date and giving all the facts regarding the Raw Materials, Chemicals and Specialties, as required by careful buyers like us—quantity buyers and importers—and for which information it may be necessary to refer to many books, reports, publications and files.

I am renewing my subscription, with great pleasure, to CHEMICAL INDUSTRIES for a period of 3 years.

S. JAJODIA,
Associated Agencies,
Madras, India.

CALENDAR OF EVENTS

May 15-16. American Water Works Assoc. Ohio Section, Toledo, O.
May 18-20. Flavoring Extract Manufacturers' Assoc. 33d Annual Convention, Hotel Pennsylvania, New York, N. Y.
May 18-22. American Association of Cereal Chemists, Annual Meeting, Edgewater Beach Hotel, Chicago, Ill.
May 19. Akron Section, American Institute of Chemical Engineers, Akron City Club, Akron, Ohio.
May 22. American Institute of Chemists, New York Chapter, Annual Meeting, Chemists' Club, New York, N. Y.
May 22, New York Section, American Assn. of Textile Chemists and Colorists, Regular Monthly Meeting, Swiss Chalet, Rochelle Park, N. J.
May 23, Chicago Drug & Chemical Assn., Annual Spring Dinner Dance, Red Lacquer Room—Palmer House, Chicago, Ill.
May 25, Association of Consulting Chemists & Chemical Engineers, Inc., Council Meeting, The Chemists' Club, New York, N. Y.
May 25, Junior Chemical Engineers, Get-Together, Childs Restaurant, 109 West 42nd St., New York, N. Y.
May 25-27, American Gas Association Production and Chemical Conference, New York, N. Y.
May 25-27, National Association of Purchasing Agents, 27th Annual International Convention, and Inform-a-show, The Waldorf-Astoria Hotel, New York, N. Y.
May 26-28, National Lime Association, Annual Convention, The Homestead, Hot Springs Va.
May 27, New York Section, American Assn. of Textile Chemists and Colorists, Regular monthly meeting, Swiss Chalet, Rochelle Park, N. J.
May 28-29, Tanners' Council of America, Spring Meeting, White Sulphur Springs, W. Va.
June 1-3, Scientific Apparatus Makers of America, Hotel Hershey, Hershey, Pa.
June 1-2, The American Leather Chemists' Ass'n, Annual Meeting, Deshler-Wallick Hotel, Columbus, O.
June 4, Manufacturing Chemists' Assoc., Waldorf Astoria Hotel, New York, N. Y.
June 5, American Management Association, General Management, Pennsylvania Hotel, New York, N. Y.
June 5-6, Synthetic Organic Chemical Manufacturers' Association, Seaview C. C., Absecon, N. J.
June 6, American Institute of Consulting Engineers, Engineers' Club, New York, N. Y.
June 7-9, The American Society of Refrigerating Engineers, 29th Spring Meeting, Skytop Club, Skytop, Pa.
June 8-9, American Management Association Insurance Conference, Astor Hotel, New York, N. Y.
June 8-9, Texas Cottonseed Crushers' Assn., Annual Convention, Mineral Wells, Texas.
June 8-10, American Electro-Platers Society, Annual Convention, Grand Rapids, Mich.
June 8-9-10, The National Fertilizer Association, 18th Annual Convention, Greenbrier Hotel, White Sulphur Springs, W. Va.
June 8-11, American Electroplaters' Society, Annual Convention, Pantlind Hotel, Grand Rapids, Mich.
June 8-9, National Assn. of Insecticide and Disinfectant Mfrs., Edgewater Beach Hotel, Chicago, Ill.
June 8-11, American Pharmaceutical Manufacturers' Association, Annual Meeting, The Homestead, Hot Springs, Va.
June 8-11, The American Society of Mechanical Engineers, Semi-Annual Meeting, Statler Hotel, Cleveland, O.
June 8-11, American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J.
June 21-25, American Water Works Assoc. Annual Convention, The Stevens Hotel, Chicago, Ill.
June 22-26, American Institute of Electrical Engineers, Summer Convention, Chicago, Ill.
June 22-26, American Society for Testing Materials, 45th Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.
June 29, Association of Consulting Chemists & Chemical Engineers, Inc., Council Meeting, The Chemists' Club, New York, N. Y.
July 22-24, American Society of Civil Engineers, Annual Convention, Spokane, Wash.
July 27, Association of Consulting Chemists & Chemical Engineers, Inc., Council Meeting, The Chemists' Club, New York, N. Y.


A · BICHROMATE OF SODA
MIC ACID · CHROMIC ACID
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Mutual
Bichromates
MUTUAL CHEMICAL CO. OF AMERICA
MUTUAL
NEW YORK N.Y.
BICHROMATE OF POTASH
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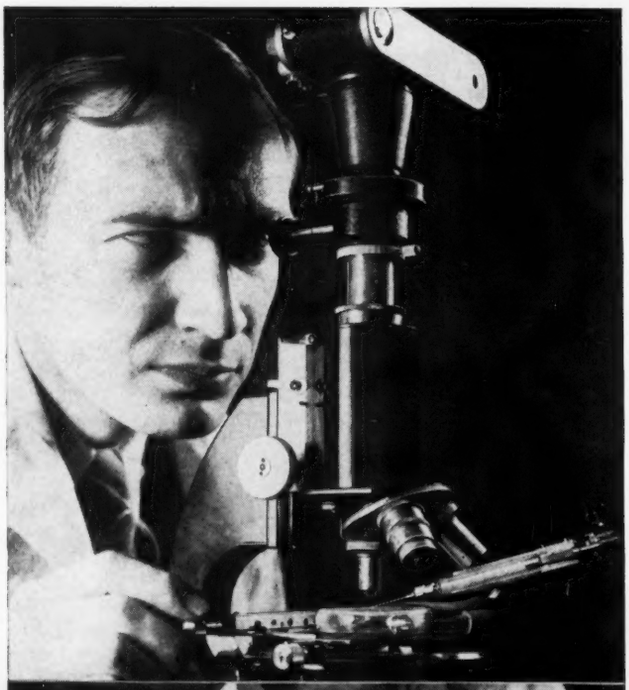
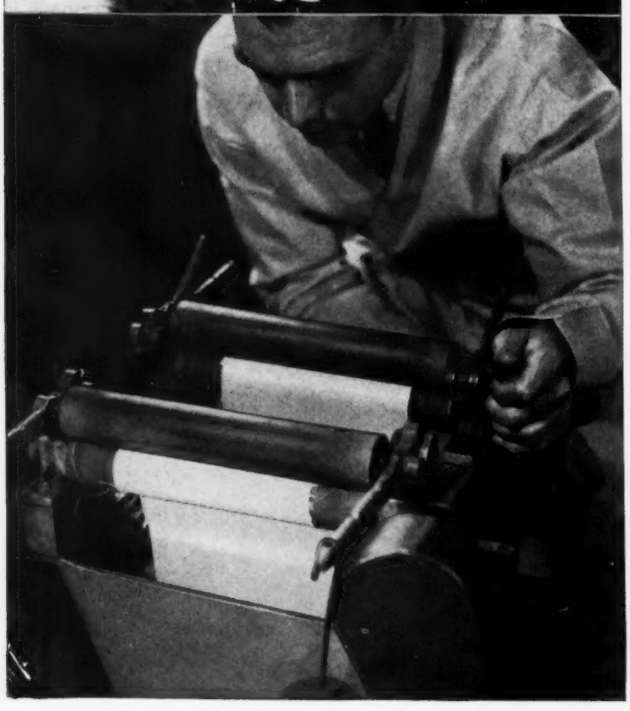
PLANTS AT BALTIMORE AND JERSEY CITY MINES IN NEW CALEDONIA

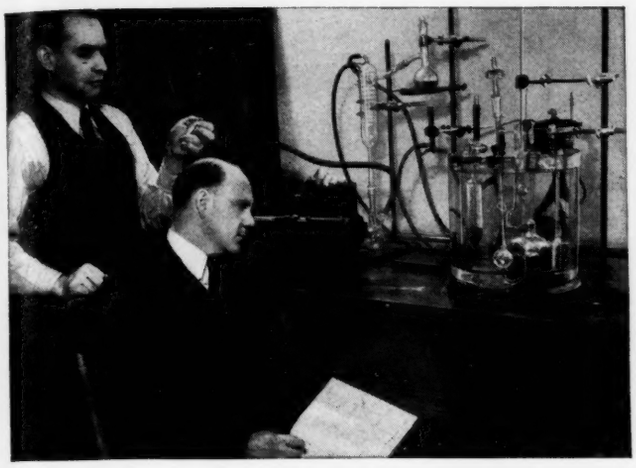
Life ON THE CHEMICAL NEWSFRONT



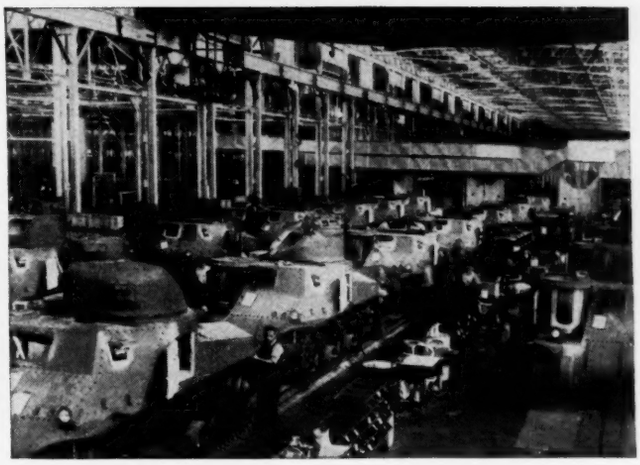


(*Left*) **ON WAR FRONT OR HOME FRONT,** the Technical Service Department of Cyanamid's Calco Chemical Division offers invaluable assistance in the dyeing of textiles. On government contracts, Calco can give detailed specifications on color formulas, equipment, and procedure. For civilian goods, Calco can advise on satisfactory substitute dyestuffs and finishing agents. Intensive research is being carried on in Calco's laboratories for the solution of these current problems—and for the development of better dyestuffs and finishing agents for future needs. Typical scenes at Calco show (above) color photomicrography applied to the dyeing of a single fiber of wool by a droplet of dye; (below) padder and jig in the Application Laboratory, duplicating methods used in dye mills.

(*Below*) **SHARKS HOLD NO TERRORS** for chemical research workers, who have found ways to convert this age-old enemy of man into a beneficent friend. Secret of this strange about-face lies in the shark's liver, which has been discovered to contain Vitamin A in a higher concentration than any other known substance. This is especially significant in view of the fact that a shark's liver accounts for one-fourth of his total weight. This new source of Vitamin A is expected to supplement other known sources, thus helping to meet the exceptionally high demand for vitamins necessary to maintain high standards of physical fitness both among the armed forces and among civilians.

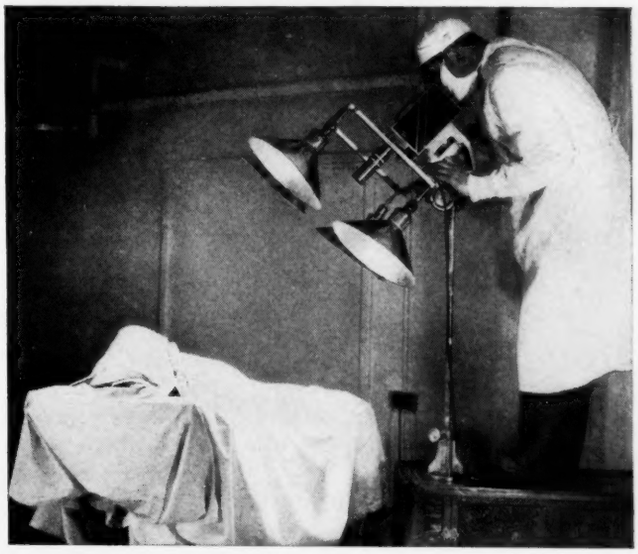


(*Above*) **WHOLE NEW FIELDS OF CHEMICAL RESEARCH** may be opened by studies of the potentialities of liquefied sulphur dioxide. While the gaseous form of this compound has been extensively used in the manufacture of sulphuric acid, its applications in the liquid state have not yet been fully exploited. Studies conducted by Drs. J. Russell Bright and Joseph J. Jasper at Wayne University indicate that the liquefied form offers possibilities as a solvent, and that many new sulphur dioxide addition products can be prepared. Photo shows Dr. Bright (standing) and Dr. Jasper with apparatus used for purification of such products and also for measuring density, surface tension, and viscosity of purified product. Cyanamid's Calco Chemical Division is a major supplier of SO_2.



(*Above*) **TANKS ROLL OFF THE FINISHING LINE** at one of the country's tank plants, ready to take their part in the nation's Victory program. Modern high-speed finishing techniques which keep tanks moving without delay through the last production stage are aided in many cases by Cyanamid's developments. Among the newest of these is the development of the MELMAC** Resins, especially desirable in finishes that combine high speed with excellent resistance to scratching and to the effects of heat, water, and exposure to weather. Other Cyanamid products for the manufacture of finishes characterized by high speed and durability are the REZYL**, PHENAC*, TEGLAC**, and BEETLE** Resins, each offering specific advantages in particular applications.

(*Above*) **OXALIC ACID FROM SAWDUST** is an achievement of chemical research in converting waste materials into vitally needed products. Developed by Dr. D. F. Othmer, shown indicating flow-sheet, and his associates at Polytechnic Institute of Brooklyn, the process requires, in addition to the sawdust, only such staple chemicals as lye, lime, and sulphuric acid. The sawdust is fused with the lye and the resultant mass treated with the lime and acid. Yield is 112 pounds of oxalic acid from 100 pounds of sawdust; and, in addition, 20 pounds of acetic acid, 4 pounds of formic acid, and 6 pounds of wood alcohol are obtained. These by-products reduce effective cost of producing the oxalic acid.



(*Above*) **SURGERY TURNS TO TECHNICOLOR** for a permanent record of unusual operations that can be used for instruction. At The Brady Urological Institute of the Johns Hopkins Hospital and University, Mr. William P. Didusch employs a technique of color filming in which differences between muscle, tissue, fat, and body fluids are clearly distinguishable. Film is edited to produce an apparently continuous picture, though all routine procedures are eliminated. As color filming techniques enter new fields of usefulness, REDSOL* Crystals (potassium sodium ferricyanide), developed by Cyanamid, offer a more stable, more uniform material for processing color film than the formerly imported red prussiate of potash.

American Cyanamid & Chemical Corporation

30 ROCKEFELLER PLAZA · NEW YORK, N. Y.

WASHINGTON

By T. N. Sandifer

THE various expedients around Washington to head off any really positive legislative intervention in the labor mess have been more soporific than effective at this writing, and there is growing evidence, despite any pending efforts in either House or Senate, that this is a long-term issue destined to carry over into the next era.

It is generally recognized by more impartial observers of Washington's aerobatics on any hot controversy, that the Administration almost out-performed itself in recent weeks in the effort to allay popular feeling. In the category of such antics was the long series of "exposures" of patent juggling, if it can really be called that, of high profits on the part of war plants, and the procession of more subservient Federal agency heads to the Capitol to tell Senators or Representatives that there was really no delay in the war effort from labor.

T. N. Sandifer

To positive evidence of public feeling over the whole issue has now been added the fact that some 13,000,000 of the most responsible group of the nation's men, the men in the upper age brackets, are now registered in a sort of blank-check gesture. For, at this writing, no indication had been given as to what it was proposed to do with the men, of high and low degree, financially, who have thus entered the pool of national service.

The first effort made to draw these men into some extraordinary war service, if accompanied by any such exhibitions as the slow-downs and other damaging labor tactics in war plants, which have more than offset any accretion to workers' ranks from new sources of emergency workers, women, etc., will touch off a new demand for handling these matters with gloves off.

No Congressman coming up for election this Fall, as all must, can be expected to have the straightforward courage to meet any such demand, but 13,000,000 men are a bloc that will have to be reckoned with just the same as any other organized element of the country. And this group numbers the men who count.

It is regarded by many as a comment on the Washington approach to the war effort that more than two years after a state of emergency was nationally proclaimed by the President, and a good five months after the nation was actually attacked by a ruthless foreign enemy, no real attempt to stabilize the labor situation has been evident. For comparison, weak as it seemed then, the national policy in the first World War is a model of determined handling and recognition of the factors of national safety at stake.

Whatever Congress decides, letters to many members from constituents are an index to the feeling in the country that the labor issue is no longer one to be solved in the hitherto characteristic fashion of passing it from one agency to another, and when that failed, inventing a new agency, manned by the same men.

In view of the national character of Federal price action at this time importance attaches to announcement that R. G. Phelps has been designated price executive of the chemical section of the Office of Price Administration.

As a chemical engineer he built explosive plants in the first World War; serving in 1916 as chemical engineer for E. I. du Pont de Nemours in charge of construction of acid plants, and later supervising construction of explosive plants in Canada, and later in the war, construction and operation of a synthetic phenol plant for Aetna Chemical Co., New York.

A native of Maryland, he graduated from the University of Maryland in 1911, where he had specialized in chemical engineering and pharmacy. Mr. Phelps has been indentified with various enterprises in both industrial chemicals and other fields. Previously he was associate price executive in the OPA before his recent appointment.

In another direction, Donald Nelson, as chairman of the War Production Board, has pointed to the number of appointments he has made from the industrial field, to facilitate the change-over from normal to war production in virtually every field of industrial activity. Among these appointments is that of Dr. A. B. Pacini, of American Home Products, Jersey City, in toiletries and cosmetics.

Among the supplies incidentally, of which wholesalers, distributors, jobbers, branch warehouses, dealers and retailers, may now carry only limited inventories under WPB action, are those in certain categories of health supplies, while curtailments already have been noted which affect quinine, tung oil, resins and solvents.

As time draws near for conversion of nation-wide industrial activities to the Procurement Requirements Plan instead of specifically permitting various operations under numerous orders, a distinct slackening in the outflow of such orders and regulations has been noted from both WPB and affiliated war agencies.

Among outstanding actions pertaining to the chemical field was an amendment to L-63, Distributors' Inventory Limitation Order, by which health supplies were removed from the list of products subject to control by that order.

This amendment relieves such distributors from specific limitations as to dollar volume, formerly imposed under the order; however they remain subject to the general limitations of Priorities Regulation Number 1, which requires all producers and dealers to keep inventories to a practicable working minimum.

Hereafter, priority assistance for producers of health supplies will be provided under the Health Supplies Rating plan, such distributors no longer being included in those entitled to apply for priority assistance on Form PD-IX.

By this time the country will have shaken down to the unprecedented price-fixing action of the Administration, functioning through OPA. The move is admittedly an anti-inflationary measure, but there is little question it has other aspects that will become clearer in the coming weeks. The Government is becoming more pressing, for instance, in its financing activities, and there is a clear relationship between what the average person pays for his daily living, and what he feels he can pay to the Government. This is only one phase.

The chemical field was largely included in the commodities covered by price

(Continued on page 673)

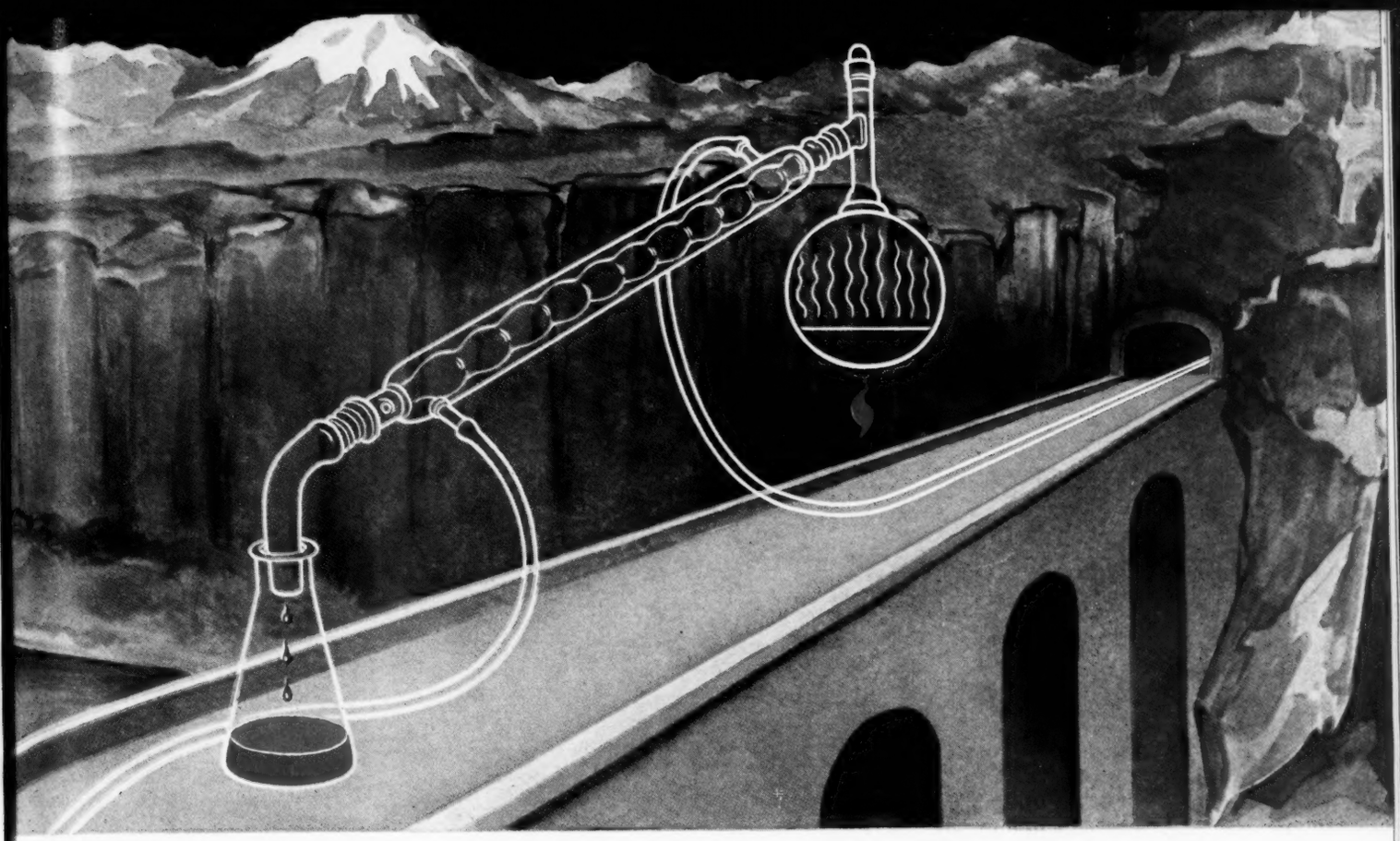
FROM THE ORIGINAL, PAINTED ESPECIALLY FOR NIAGARA ALKALI COMPANY BY DE POSTELS

FOR MORE than thirty years Niagara Alkali Company and Electro Bleaching Gas Company have been working side by side, each serving its customers separately. Today their manufacturing, research and personnel facilities are unified into one compact organization, geared for service on a more efficient scale. Resources and products remain the same, as do the friendly customer relations that have been built up over the years. But the new organization is prepared to give smoother, more satisfactory service — and to respond with a fuller measure to the demands of the industries that use its products. The name of this new organization is NIAGARA ALKALI COMPANY.

EBG Niagara ALKALI COMPANY

60 EAST 42nd STREET, NEW YORK, N. Y.

CAUSTIC POTASH · CAUSTIC SODA
PARA · CARBONATE OF POTASH
Liquid Chlorine



Tunneling through Priorities Mountain

A mighty job is being done by America's basic weapon—Chemical Research.

In the path of hundreds of manufacturers, today, stands a mountain *built* by necessity. It is Priorities Mountain, and it blocks off many raw materials.

Yet Chemical Research *tunnels through!* Chemical Research in the laboratories of thousands of manufacturers. Supplying synthetics and substitutes that are eagerly sought and bought. Bringing about new methods of manufacturing and processing. Actually *improving* products. Meeting the demands of both National Emergency and private enterprise!

* * *

In the far reaching changes that have taken place, many tonnage chemicals to exacting specifications have been required by industry. And it has been the privilege of the J. T. Baker Chemical Co. to supply some of these chemicals.

In many instances where companies required tonnage chemicals of small and exacting tolerances, the manufacturers have submitted their problems directly to us. In such cases, Baker willingly contributes the combined knowledge of its Technical, Executive and Manufacturing staffs to meet the customer's special requirements.

Baker knows the art of exactness. If you have chemical requirements of standard or special specifications, we invite you to discuss, in confidence, your needs with a Baker representative.

—o—

J. T. Baker Chemical Co. *Executive Offices and Plant:* Phillipsburg, N.J. *Branch Offices:* New York, Philadelphia and Chicago.

Baker's

CHEMICALS

MOST OF IT

THE above statement is qualified because there is something worth while war does for us. It makes us all work harder, keep more alert, more attuned to the problem of producing still more and still better materials.

Under war pressure, our experts are at work on still further applications of alkalies to the textile, glass, paper, ceramic, soap and allied manufacturing fields.

Feel free to call on us at any time. We may be able to assist you in the solution of your problem.

MICHIGAN ALKALI COMPANY

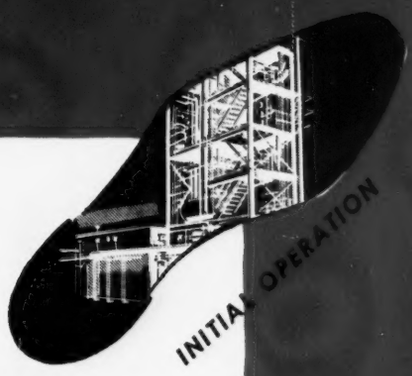
FORD BUILDING, DETROIT, MICHIGAN

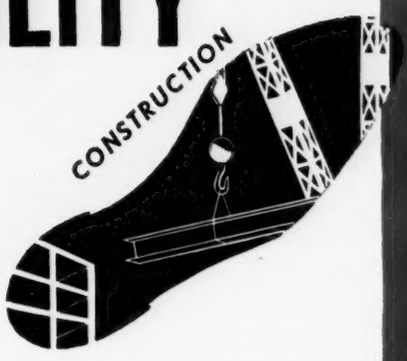
NEW YORK • CHICAGO • CINCINNATI • ST. LOUIS • CHARLOTTE • WYANDOTTE

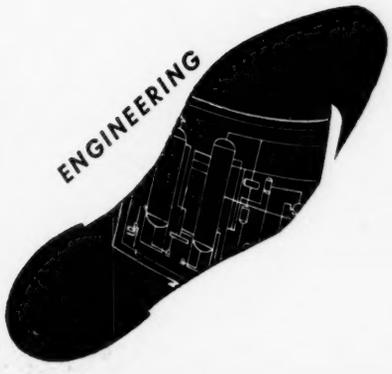
DISTRIBUTORS IN ALL PRINCIPAL CITIES

SODA ASH • CAUSTIC SODA • CHLORINE • BICARBONATE OF SODA • CALCIUM CARBONATE • CALCIUM CHLORIDE • DRY ICE

5 STEPS UNDER 1 RESPONSIBILITY







BLAW-KNOX BUILDS COMPLETE PROCESS PLANTS

Whatever your process—Blaw-Knox is ready to take it directly to market by building your complete plant from design to actual operation. And all under single responsibility and single guarantee to save you money, assure maximum operating efficiency.

BLAW-KNOX

Division of Blaw-Knox Company

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Complete plants or equipment for the following processes . . .

Distillation
Gas Absorption
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Kilning and Calcining
Polymerizing
Evaporation
Crystallization
Drying
Mixing and Stirring
Organic Synthesis
Emulsification
High Pressure Processing
Impregnating
Gas Cleaning
and others

CORROSION *can be*

★ In the Chemical Process Industries ACE RUBBER PROTECTED equipment is armored against corrosion and contamination. ★ Engineers specify Ace rubber linings for tanks, tank cars, pipe, pipe fittings, valves, pumps, specialties, etc., because

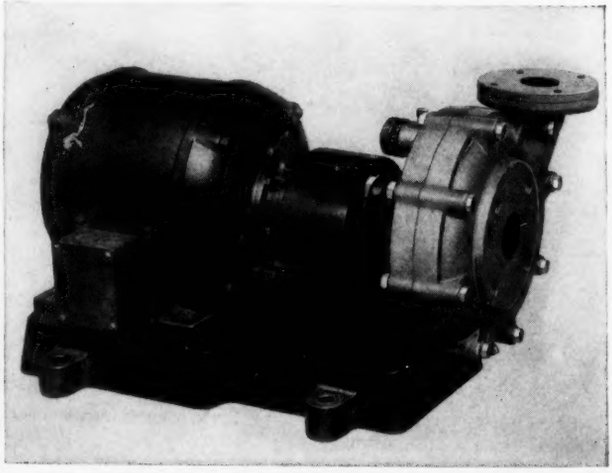
- • • ACE rubber linings give positive protection against corrosion and contamination
- • • have wide temperature range...often at the boiling point of water
- • • may be compounded to meet definite service requirements
- • • are smooth, easily cleaned and non-porous

FOR CERTAIN APPLICATIONS

Only HARD RUBBER will do!

The search for a plastic with the proper combination of physical and chemical properties will lead you to ACE hard rubber. Ace hard rubber is totally unlike other moldable materials and for certain industrial applications stands supreme.

Ace hard rubber lined Gate Valve. Available from 2 in. to 20 in. sizes (except 2½, 3½ and 5 in.).

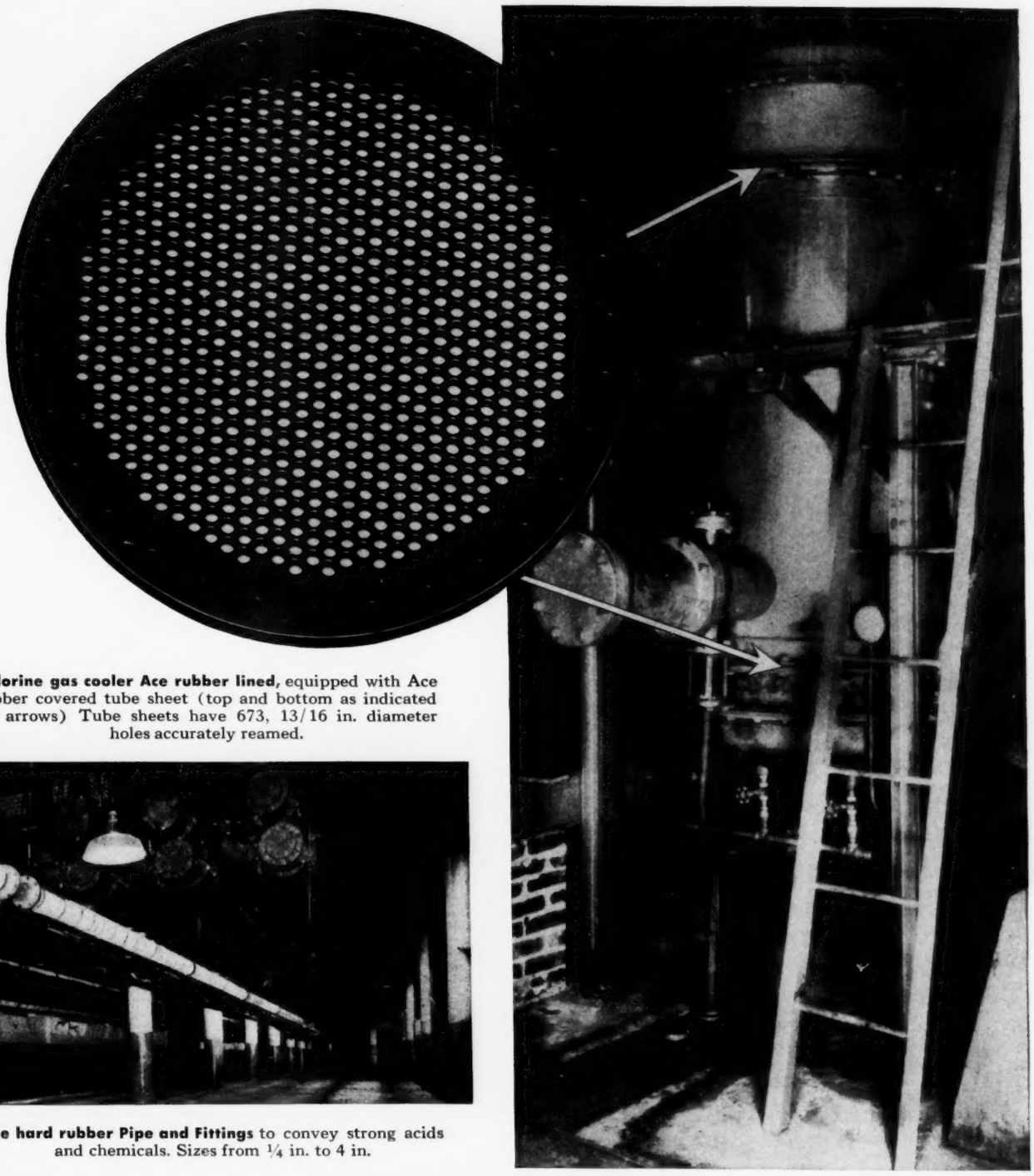


W.A.M. Hard Rubber Centrifugal pump, simplified design. Outstanding for handling acids and chemicals. Also Ace Rubber Protected Double Acting, Single Acting and Rotary Gear pumps.

ACE

AMERICAN HARD RUBBER COMPANY, 11 MERCER STREET, NEW YORK, N. Y.

PREVENTED . . .



Chlorine gas cooler Ace rubber lined, equipped with Ace rubber covered tube sheet (top and bottom as indicated by arrows) Tube sheets have 673, 13/16 in. diameter holes accurately reamed.

Ace hard rubber Pipe and Fittings to convey strong acids and chemicals. Sizes from ¼ in. to 4 in.

RUBBER PROTECTION

for Defense against Corrosion

AKRON, OHIO 111 WEST WASHINGTON STREET, CHICAGO, ILLINOIS

STANDARD SILICATES

ALKALI

—in grades to meet your needs
—of uniform, dependable quality
—with ideal characteristics

MAKE YOUR PRODUCTION PROBLEMS *Easier!*

GRADE 33
Specific Gravity 40.0°–41.2° Be 1.381–1.397
Ratio (by weight) $1Na_2O$: $3.3SiO_2$
Weight per gallon 11.5 lbs.
% Solids (approx.) 37.3
PACKAGES NET WEIGHT
Drums (55 gal.) Approx. 630 lbs.
Tank Cars Approx. 110,000 lbs.

GRADE 34
Specific Gravity 33.5°–34.5° Be 1.30–1.31
Ratio (by weight) $1Na_2O$: $3.72SiO_2$
Weight per gallon 10.9 lbs.
% Solids (approx.) 30.2
PACKAGES NET WEIGHT
Drums (55 gal.) Approx. 600 lbs.

GRADE 40
Specific Gravity 40.0°–41.5° Be 1.38–1.40
Ratio (by weight) $1Na_2O$: $3.22SiO_2$
Weight per gallon 11.6 lbs.
% Solids (approx.) 37.5
PACKAGES NET WEIGHT
Drums (55 gal.) Approx. 630 lbs.
Tank Cars Approx. 110,000 lbs.

GRADE 40 CLEAR
Specific Gravity 40.0°–41.5° Be 1.38–1.40
Ratio (by weight) $1Na_2O$: $3.22SiO_2$
Weight per gallon 11.6 lbs.
% Solids (approx.) 37.5
PACKAGES NET WEIGHT
Drums (55 gal.) Approx. 630 lbs.
Tank Cars Approx. 110,000 lbs.
Tank Trucks Approx. 25,000 lbs.
(Tank truck deliveries only to points in close proximity to our Jersey City plant).

GRADE 42
Specific Gravity 41.5°–42.5° Be 1.40–1.415
Ratio (by weight) $1Na_2O$: $3.22SiO_2$
Weight per gallon 11.7 lbs.
% Solids (approx.) 38.7
PACKAGES NET WEIGHT
Drums (55 gal.) Approx. 640 lbs.
Tank Cars Approx. 110,000 lbs.

GRADE 42 WATER WHITE
Specific Gravity 41.5°–42.5° Be 1.40–1.415
Ratio (by weight) $1Na_2O$: $2.5–2.6SiO_2$
Weight per gallon 11.7 lbs.
% Solids (approx.) 38.2
PACKAGES NET WEIGHT
Drums (55 gal.) Approx. 630 lbs.
Tank Cars Approx. 110,000 lbs.
Tank Trucks Approx. 25,000 lbs.
(Tank truck deliveries only to points in close proximity to our Jersey City plant).

GRADE 47 BOND BRAND
Specific Gravity 46.0°–48.0° Be 1.465–1.495
Ratio (by weight) $1Na_2O$: $2.84SiO_2$
Weight per gallon 12.3 lbs.
% Solids 42.2
PACKAGES NET WEIGHT
Drums (55 gal.) Approx. 675 lbs.
Tank Cars Approx. 110,000 lbs.

GRADE 50
Specific Gravity 49.0°–51.0° Be 1.51–1.54
Ratio (by weight) $1Na_2O$: $2SiO_2$
Weight per gallon 12.7 lbs.
% Solids 43.5
PACKAGES NET WEIGHT
Drums (55 gal.) Approx. 700 lbs.
Tank Cars Approx. 110,000 lbs.

GRADE 52
Specific Gravity 51.0°–53.0° Be 1.54–1.58
Ratio (by weight) $1Na_2O$: $2.4SiO_2$
Weight per gallon 13.0 lbs.
% Solids 46.6
PACKAGES NET WEIGHT
Drums (55 gal.) Approx. 700 lbs.
Tank Cars Approx. 110,000 lb .

GRADE 58
Specific Gravity 58.5°–59.5° Be 1.68–1.695
Ratio (by weight) $1Na_2O$: $1.58SiO_2$
Weight per gallon 14.0 lbs.
% Solids (approx.) 49.8
PACKAGES NET WEIGHT
Drums (55 gal.) Approx. 800 lbs.
Tank Cars Approx. 110,000 lbs.

GRADE 60
Specific Gravity 59.0°–61.0° Be 1.69–1.73
Ratio (by weight) $1Na_2O$: $1.87SiO_2$
Weight per gallon 14.2 lbs.
% Solids 53.7
PACKAGES NET WEIGHT
Drums (55 gal.) Approx. 800 lbs.
Tank Cars Approx. 110,000 lbs.

CONSERVE VITAL MATERIALS

Standard Technical Service will gladly help you conserve materials, reduce costs and maintain quality during changing conditions and shortages, through correct application and processing. Write today.

AND MANY SPECIAL SILICATES . . .

are manufactured by Standard, having chemical and physical properties especially suited for particular uses.

DIAMOND ALKALI COMPANY • Standard Silicate Division

Plants at CINCINNATI · JERSEY CITY
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Do you use ammonium salts?

maybe you should consider

ammonium thiocyanate

(Ammonium Sulfocyanide)

Here is a newly-available ammonium salt with interesting possibilities introduced by the thiocyanate group.

If you are now using an ammonium salt in your processes . . . such as chloride, acetate, oxalate, carbonate or nitrate . . . perhaps you will discover valuable modifications by substituting ammonium thiocyanate.

It is worth testing in your laboratory.

Ammonium thiocyanate has a behavior similar to other ammonium salts, but it also brings you all the variations of the thiocyanate group.

This group is remarkably stable and, in many reactions, resembles the halogens.

Koppers has recently placed in operation a large commercial plant for the production of ammonium thiocyanate crystals and can now offer this chemical in quantity at substantial savings over former costs. Koppers can supply ammonium thiocyanate in crystal form having a minimum purity of 95%.

Test samples, quotations and other information sent on request.

KOPPERS COMPANY

TAR AND CHEMICAL DIVISION · PITTSBURGH, PA.

INDUSTRIAL PRODUCTS BY FERMENTATION PROCESSES

NOAH has received credit for one of the earliest recorded chemical discoveries. He found that under some conditions grape juice underwent a change and the resulting product, when imbibed, produced a pleasant physiological effect entirely different from that which the original juice gave. Unfortunately, as a result of continuing his testing "not wisely but too well", he has received some undesirable notoriety.

It was also observed at an early date that sometimes fruit juices underwent another type of change which resulted in the development of sourness. Milk was also found to become sour on storage. Since the resulting products found practical use, empirical methods of regulating these alterations were developed.

Not until the investigation of Pasteur was it recognized that these changes were due to the growth of various microscopic organisms. It had been noticed earlier, however, that the development of visible organisms, termed molds, also resulted in changes of the medium on which they grew.

Since Pasteur a large number of experimenters have developed methods not only of preventing, but also of encouraging, the growth of these organisms, both visible and microscopic. Others have studied the chemical changes brought about by them. It is now recognized that these reactions are similar to, or in many cases the same as, those occurring during the development of a fruit or vegetable and are natural vegetative processes.

As a result of some of these researches a considerable variety of products of industrial importance is now being manufactured by the careful cultivation of a number of these organisms. Since this is a comparatively new field, it can safely be assumed that with time the number of compounds produced by such methods will be greatly enlarged. The probability of this is increased by the fact that the raw materials for such processes are generally of American agricultural origin, thus removing any dependence on foreign products.

Chas. Pfizer & Co., Inc. has been one of the leaders in this field and is at present producing Citric Acid, Gluconic Acid, Fumaric Acid, and Oxalic Acid by such methods. From these acids a wide variety of derivatives is being manufactured. A well-trained research staff is engaged in the improvement of present processes and in the development of new products. Results in many of these latter investigations indicate that products of possible importance in a variety of fields will in time be made available.

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MANUFACTURING CHEMISTS · ESTABLISHED 1849

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LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES

CHEM-O-GRAM

WASHINGTON PRICES PRODUCTION PERSONNEL

Chemical Engineers Meet in Boston

Thirty-fourth semi-annual meeting of the American Institute of Chemical Engineers was held in Boston May 11 to 13. There were 544 industry and government representatives present. Highlight of the session was a war problems discussion held behind closed doors with Dr. Walter G. Whitman, head of the chemical engineering department of M. I. T., presiding. Dr. D. P. Morgan, deputy chief of the Chemicals Branch, WPB, gave the keynote address. Remainder of the meeting was given over to presentation and discussion of technical papers. R. Katzen and D. F. Othmer of Brooklyn Poly and A. O. Reynolds of Northwood Chemical gave a paper on new plastics using wood as a raw material. J. F. White of Monsanto gave a paper on a new highly-efficient insulating material made of sand. S. D. Kirkpatrick presided at the meeting. Dr. Gustavus J. Esselen was in charge of arrangements. Charles C. Neas, senior student at U. of Ill. received the A. McLaren White national student chemical engineering award. Second and third prizes went to Gilbert R. Schockley of the Missouri School of Mines and Metallurgy and Karl H. Rothe of Cooper Union Institute. E. Clifford Williams, vice-president and director of research of General Mills, was awarded the 1942 William H. Walker Award Medal for his paper on the manufacture of synthetic glycerin delivered at the 1939 meeting in New Orleans.

PERSONNEL:—Edward V. Osberg, formerly executive editor of INDIA RUBBER WORLD, has been made vice-president in charge of all sales and technical service of Wilmington Chemical Corp., manufacturers of Naftolen . . . Dr. Arno C. Fieldner, head of the technological branch of the U. S. Bureau of Mines, has been awarded this year's Melchett Medal for outstanding work in the development of a process for making gasoline from coal . . . Victor E. Marx has joined the staff of the American Dry Milk Institute, Inc . . . Robert A. Engel, manager of the Industrial Chemical Dept. of Givaudan-Delawanna, Inc., has resigned to accept a position with the U. S. Army Chemical Warfare Service Planning Division . . . R. W. Miller has been made manager of the technical service department of Pittsburgh Plate Glass Co.'s Columbia Chemical Division.

FERTILIZER CONVENTION MOVED:—Unexpected delay in moving Axis diplomats from White Sulphur Springs has forcedthe National Fertilizer Association to hold its 18th annual convention at the Homestead, Hot Springs, Va., June 18, 19 and 20 instead of June 8, 9 and 10. Program arrangements will follow the usual pattern despite the move. Prompt reservations are suggested.

MCA TO MEET IN NEW YORK:—Manufacturing Chemists Association will hold its 70th annual meeting at the Waldorf-Astoria Hotel, June 4, instead of at Skytop.

A. I. C. ELECTS:—Dr. Gustav Egloff, director of research, Universal Oil Products and 1940 A. I. C. Medallist was elected president of the Institute. Other officers are: Dr. Donald Price, National Oil Products, vice-president; Howard S. Nieman, patent attorney, secretary; and Walter J .Murphy, editor, CHEMICAL INDUSTRIES, treasurer. New councilors are Dr. Henry G. Knight, Chief, Bureau of Agricultural Chemistry and Engineering; Dr. Foster D. Snell, consultant; and Dr. Donald E. Andrews, Johns Hopkins University.

LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES

CHEM-O-GRAM

WASHINGTON PRICES PRODUCTION PERSONNEL

DISSOLVED:—Gulton Metal Refining and Chemical Corp. is being dissolved, operations having ceased at the end of February. Allan A. Lubitz, president of American Firstoline Corp., N. Y. City, has resigned as director of the Gulton company. Both Lubitz and American Firstoline have severed all connections with the dissolving company. American Firstoline continues its business as usual.

PENDING PATENT LEGISLATION:—Readers of CHEMICAL INDUSTRIES are urged to send for copies of two Senate Bills 2303 and 2491. Every person in the chemical industry should be vitally concerned with this proposed attack on the patent system.

PRICE CEILINGS:—Ceilings established by the general maximum price regulation will control retail selling prices in cases where there is conflict with state fair trade laws, Leon Henderson has announced.

I. G. PATENTS:—Last remaining patents or patent applications of I. G. Farbenindustrie have been taken over by Leo T. Crowley, Alien Property Custodian. New order took over 500 patent applications for processes to manufacture various types of alcohol, fuel, medicines and other chemicals. Other orders had covered several thousand other patents, among them the German concern's gasoline and synthetic rubber. It had also assumed control of affiliated companies holding other patents useful to the war effort.

OILS ORDER EASED:—WPB has granted a limited use of high lauric acid oils in food products during the summer months because of their tendency to grow rancid in hot weather. Oils including coconut, soybean, babassu, palm kernel and others, are important source of glycerine and have been reserved for that purpose in order M-60. Amendment permits manufacturers of any edible product to use in June and July 50% of the amount he used in the same month of 1941 and in August and September 25%.

SYNTHETIC RUBBER:—B. F. Goodrich Co. is providing financial aid to Cornell University in seeking a long-term solution to the rubber problem through possible new botanical sources of rubber in the Western Hemisphere. Technical assistance also will be provided.

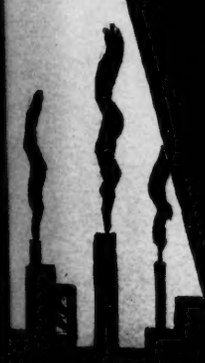
CEREAL CHEMISTS MEET:—At the annual meeting of the Midwest Section of the American Association of Cereal Chemists May 4 in Chicago, H. S. Mitchell, chief chemist, Swift & Co. was named chairman. Dr. Hanns Maister, chief chemist, American Distilling Co., spoke on alcohol. June meeting is to be omitted, next one scheduled for the Fall.

DYE MAKERS INDICTED:—Eight corporations and 20 of their officers were indicted May 14 on charges of engagingin a world-wide conspiracy to suppress competition and monopolize the manufacture and sale of dyestuffs. Du Pont, Allied Chemical & Dye, American Cyanamid, General Aniline and Film and General Dyestuff were the American firms named. Three others, all members of the Swiss group, include Ciba Co., Sandoz Chemical Works and Geigy Co. Indictment named as conspirators but did not indict 14 other firms and three individuals. Charge is violation of the Sherman Act and was handed down by the Federal Grand Jury at Trenton, N. J.

Resins and the War

RESINS are important in the War effort, therefore our research has been successfully directed towards the manufacture of S & W Resins that meet the specifications set up by the Government agencies. Where critical raw materials are involved, we are delivering resins against the proper preference ratings, and whenever possible are maintaining stocks in the large production centers throughout the country so that they are available to manufacturers without delay.

We anticipate having, as before, for use in the production of essential civilian finishes, limited quantities of certain resins that do not require critical raw materials.



THE COMPLETE RESIN LINE

"S & W" ESTER GUM—all types
"AROFENE"*—pure phenolics
"AROCHEM"*—modified types
"CONGO GUM"—raw, fused and esterified
"AROPLAZ"*—alkyds
NATURAL RESINS—all standard grades

*Registered U. S. Patent Office

All of the S & W research and production facilities are available to the trade for the many pressing problems of these times.

STROOCK & WITTENBERG CORP.

60 East 42nd Street New York N Y

. . . With Your Ideas on Ways to SPEED PRODUCTION *with* COMPRESSED AIR

Here's how you can contribute IDEAS to help win the war.

DO THIS: Describe some application of compressed air which speeds production (in your own experience or observation). The IDEA counts—not the grammar. Simple rules mailed on request.

YOUR OPPORTUNITY to pass along ideas which will speed up production and help win the war. Substantial cash prizes offered. Prize-winning papers will be brought to attention of your industry, giving recognition and prestige to the authors. All entries of value to the war effort, whether they are prize-winners or not, will be offered to the proper United States Agency with full credit to the writer.

PRIZES DOUBLED. Because of increased importance of compressed air in the war effort, prize awards as originally announced, have been doubled, and closing date has been extended to July 1, 1942.

ATTENTION EXECUTIVES. Posters announcing this IDEA Award Program are available to enable you to bring this project to the attention of your engineers and shop men. Free on request.

All requests for Rules and Posters should be addressed to Russell Gross, Educational Director, Compressed Air Institute, East Orange, New Jersey.

★ ★ ★ ★ ★ ★ ★ ★

$1000.00 IN CASH AWARDS

FIRST PRIZE $200.00 — THREE PRIZES OF $100.00

TEN PRIZES OF $50.00 — SPECIAL AWARDS $25.00 EACH

For every non-prize winning entry which is accepted for publication in a technical journal, at the request of the Compressed Air Institute.

plus

PERSONAL PRESTIGE and RECOGNITION

Uncle Sam Needs Your Ideas

HERE'S HOW YOU CAN HELP

Describe compressed air applications in your own experience or observation, which speed up production. The IDEA will be passed along to help the war effort. Write today for details.

This announcement appears here through the courtesy of

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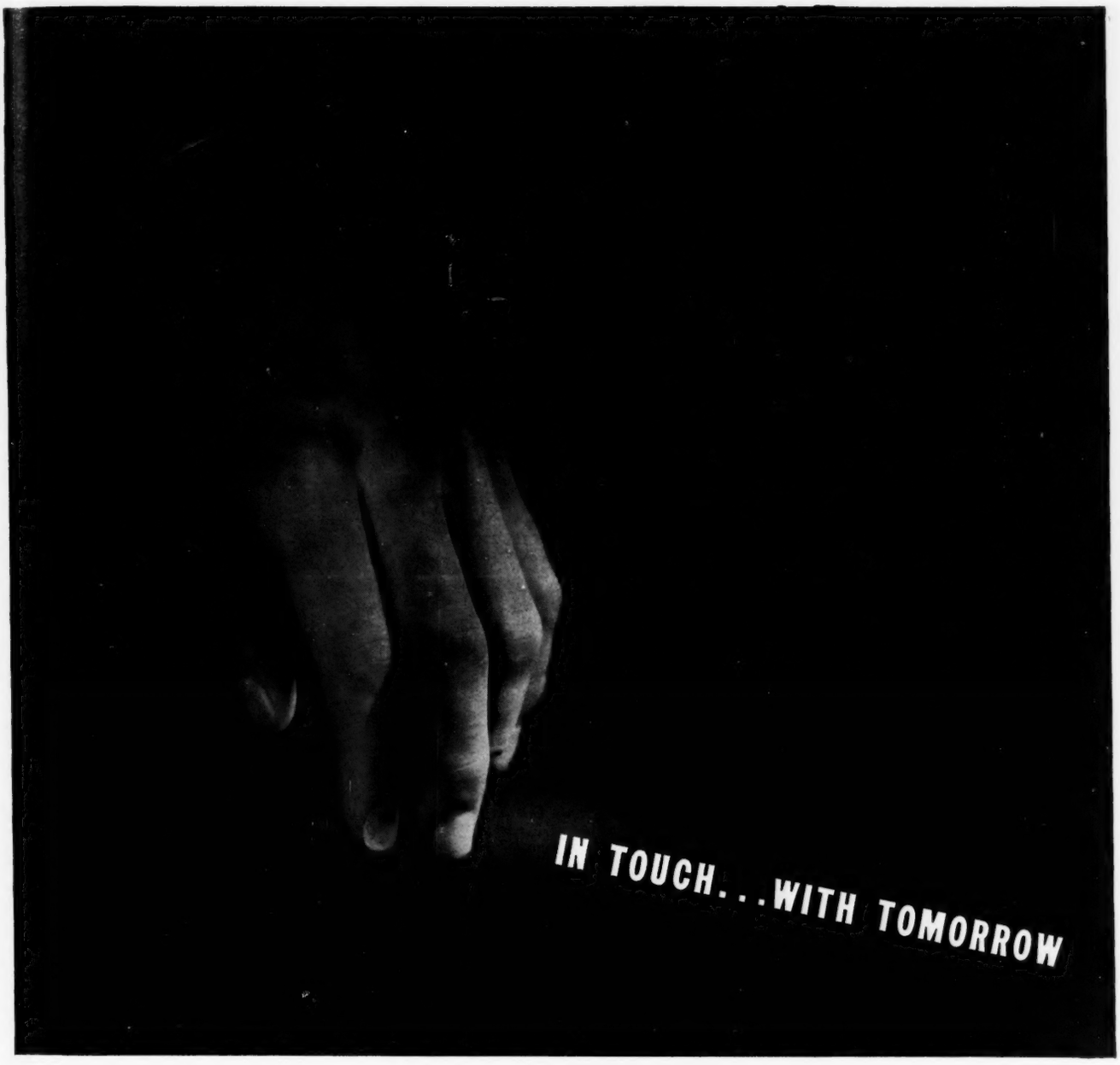

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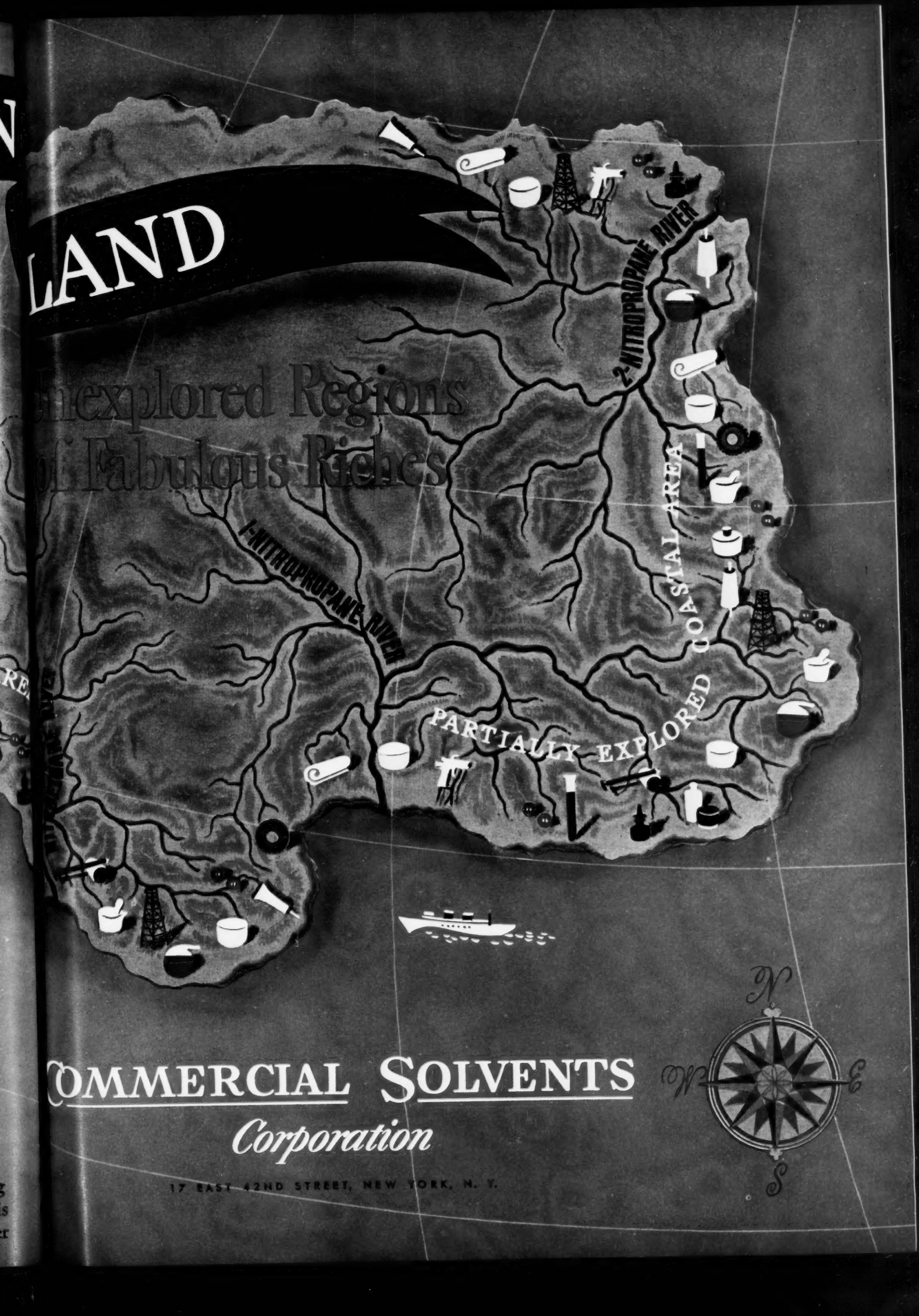

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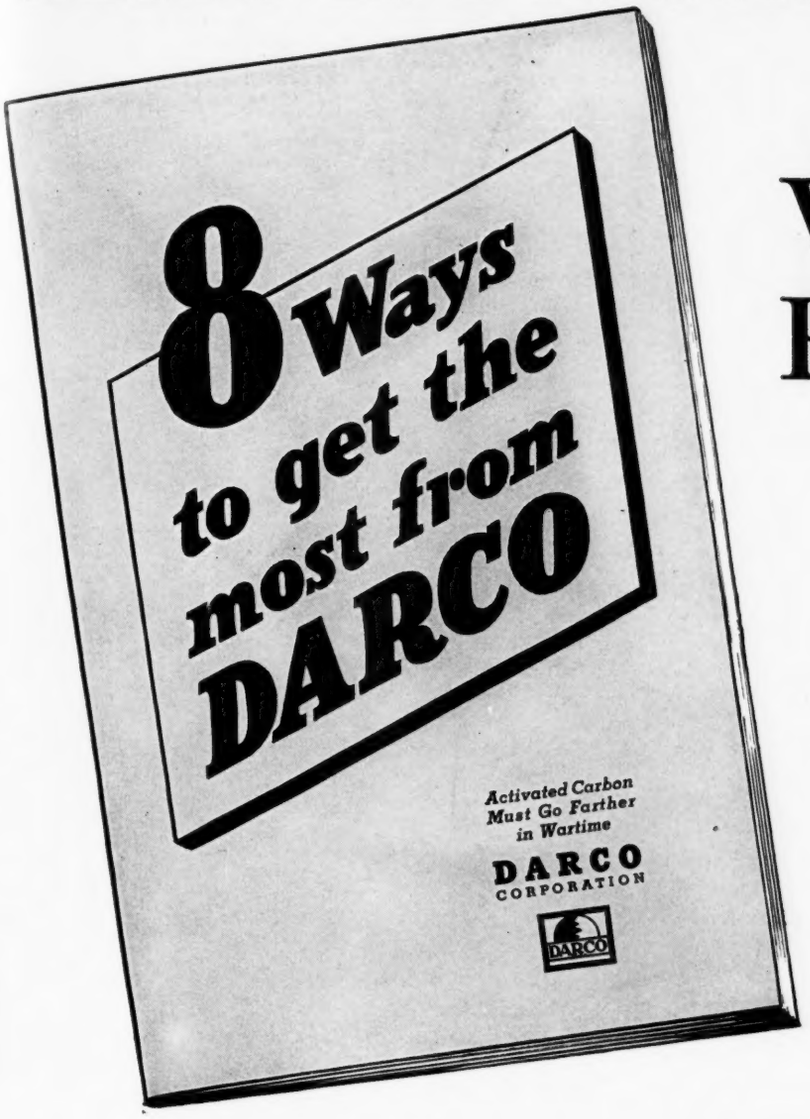

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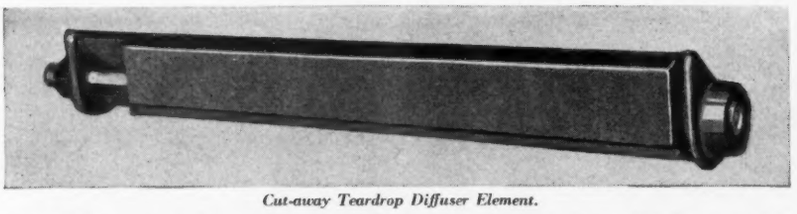
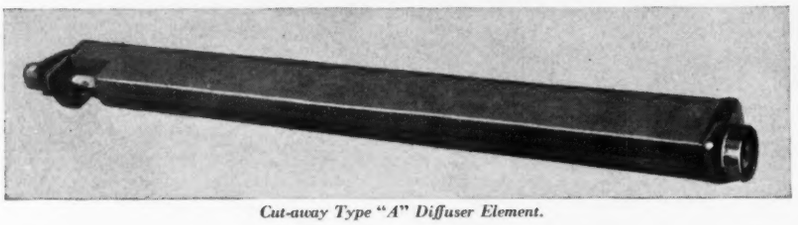
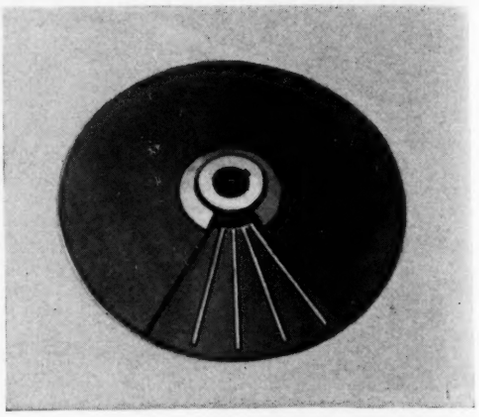


Cut-away Teardrop Diffuser Element.



Cut-away Type "A" Diffuser Element.



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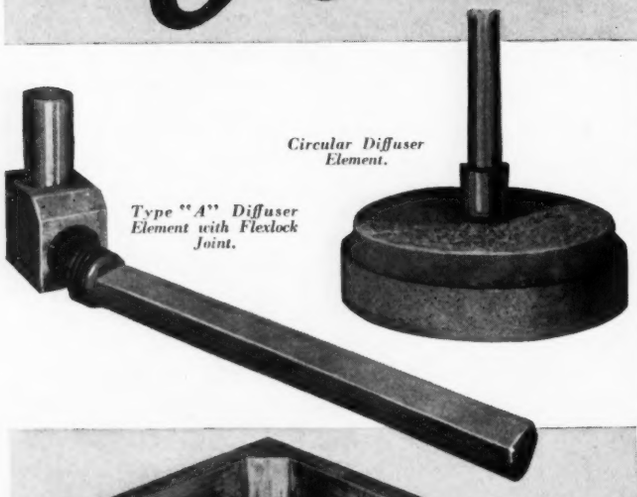

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Type "A" Diffuser Element with Flexlock Joint.

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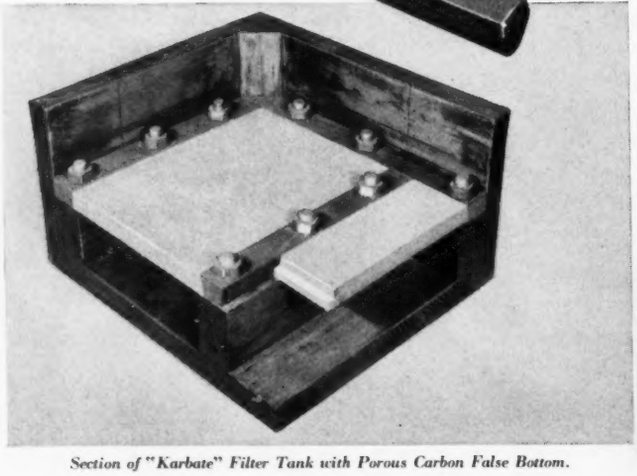

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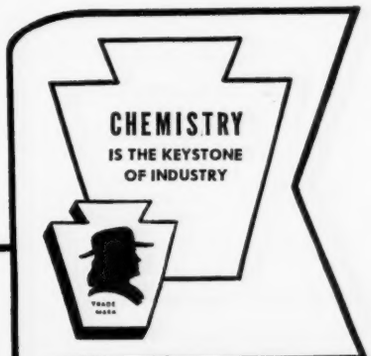

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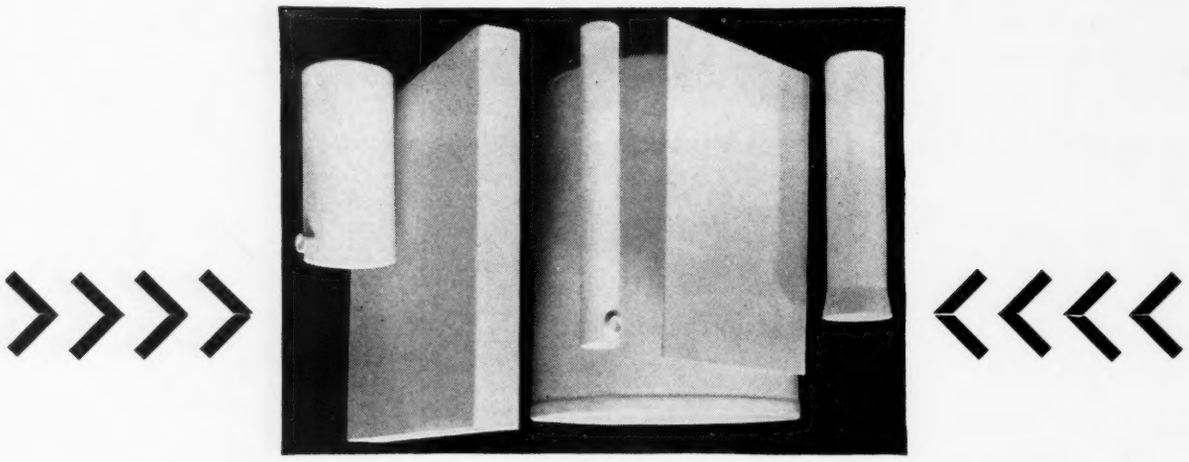

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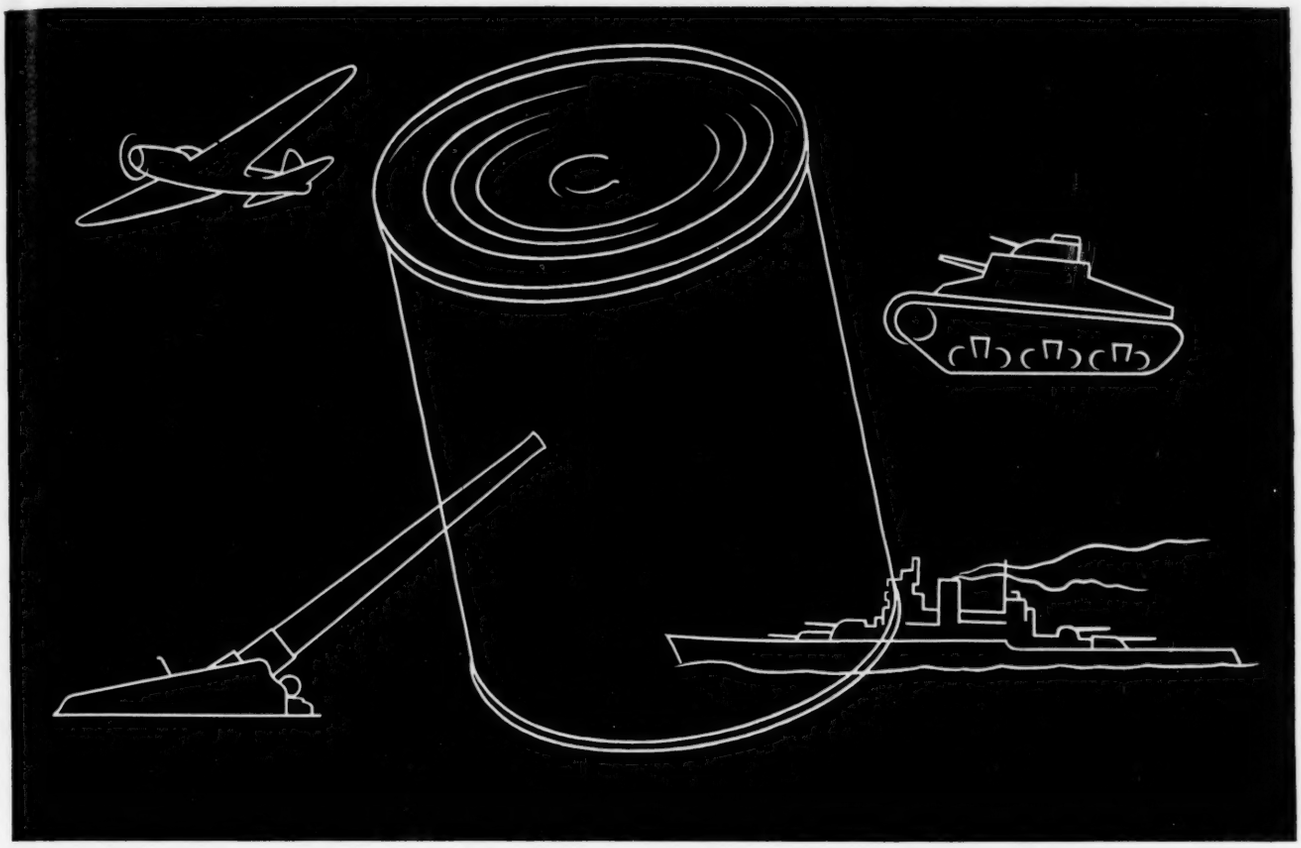

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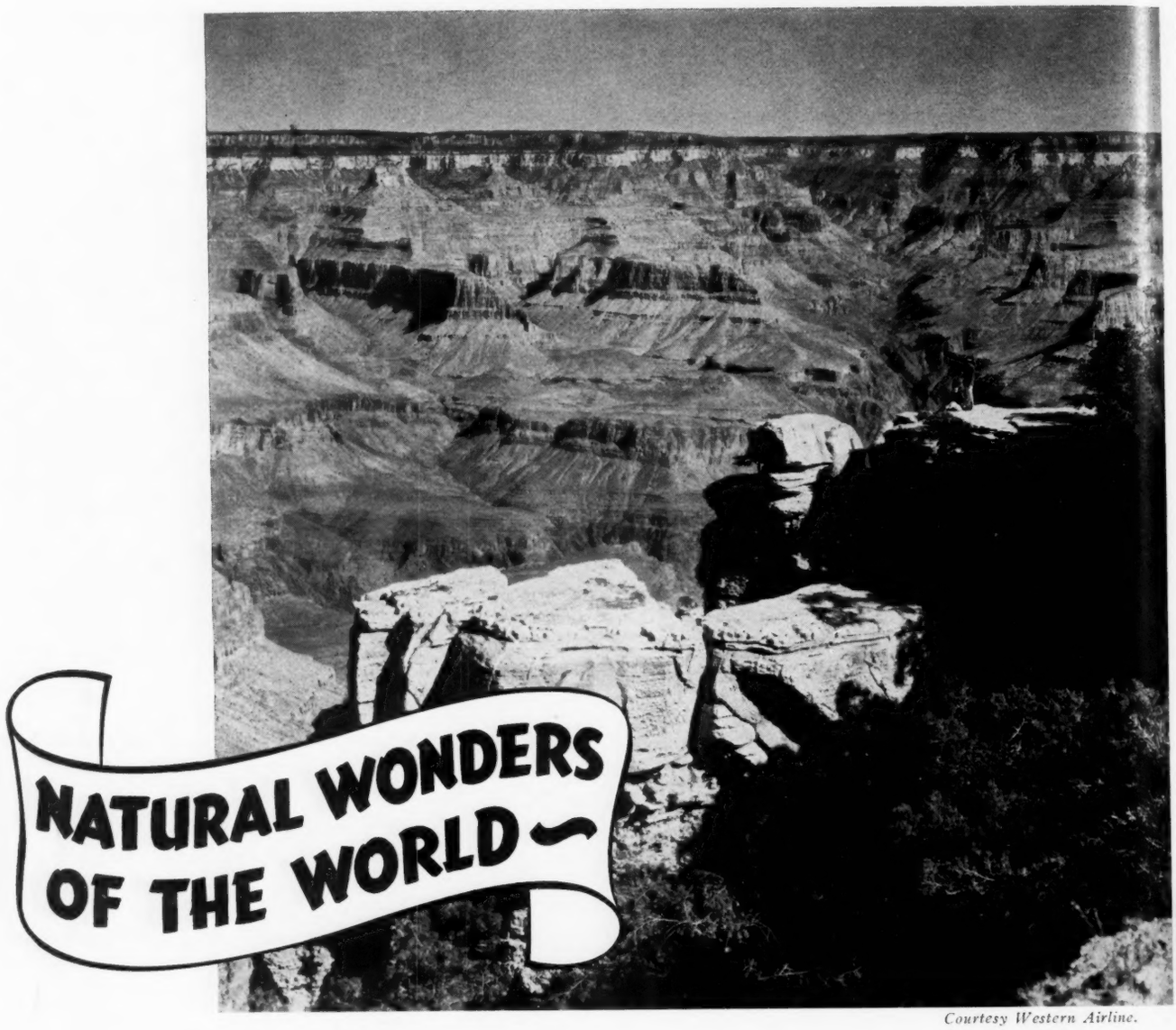

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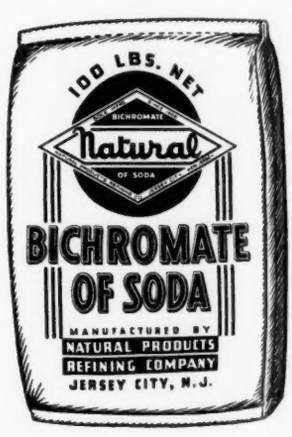

NATURAL PRODUCTS REFINING COMPANY
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Natural BICHROMATE

The U. S. Patent Structure and the War

REVISION of the patent law of this country has been debated pro and con for years by patent lawyers and others closely connected with patent practice in one way or another. There has been pretty general agreement that certain abuses existed and that certain changes were desirable, but that in the main the fundamental law was sound.

Now under war conditions the entire structure is being ruthlessly publicized and in the minds of the lay public a suspicion aroused that the welfare of the nation requires the complete elimination of patents. This is a fundamental attack on one of the most important parts of the Constitution of the United States since one of the provisions of that document secures for limited times to authors and inventors *exclusive rights* to their respective writings and discoveries. Certain prominent members of the present Washington Administration interpret exclusive rights as "a monopoly" and, therefore, necessarily a detriment to the general welfare. Such reasoning, of course, is so illogical and even silly that it seems at first blush unnecessary to take the time to refute it. But these attacks are coming from sources that cannot be lightly brushed aside. There is pending in Washington now a bill which would empower the President, in the interest of national defense or the prosecution of any war, to grant licenses to any person under any patent or patents and to acquire patents by donation, purchase, confiscation or otherwise. Furthermore, considerable sentiment has been expressed in Administration circles to the effect that patents so seized as a war measure should not be returned to the present owners when hostilities are over. And there appears to be no distinction made between the patents held by Americans or American companies and patents owned or controlled by foreign interests.

Proponents of the idea of destroying the patent structure seem to labor under the delusion that all inventions and discoveries have existed from time immemorial. They fail to grasp the fact that at some given period every invention or discovery was simply a rather hazy idea in the mind of some individual or group of individuals. They brush aside the fact that the inventor or discoverer stimulated by the idea of a possible reward has given to mankind a product that it otherwise in all probability would not enjoy. The very essence of the patent law is based upon an exchange—the inventor receiving an exclusive right (or call it a monopoly if you will) for a limited period while the general public obtains the benefit of a new product, machine or process. Just what can be substituted for this very equitable plan is not made plain either, other than the very nebulous suggestion that government laboratories do all the inventing and make all the discoveries. This reasoning or philosophy is certainly Marxian socialism with a vengeance! Also it presupposes that all the inventive geniuses will be American citizens!

American management does not oppose any broad licensing policy on patents that is necessary to win this war. Indeed, they welcome it as patriotic citizens should. But the unsung hero who has provided the housewives of America with an improved potato peeler from the innermost recesses of his brain, and so-called "big businesses" that have through their support of research provided us with thousands of new products are alike entitled to the fruits of their labor. The American public is entitled to know the truth. But what they are being fed from Washington is socialistic propaganda. Further, they should become aware that these attacks are seriously jeopardizing the very defense of their homes. In Great Britain they are not hamstringing industry at the very time that industry is being called upon to win a war of production. And it might be added that labor today has a very strong voice in British policies. The inference is certainly clear to any fair minded person.

EDITORIAL

Walter J. Murphy, Editor

A.C.S. Meetings In War Times: All things considered the recent Memphis meeting of the American Chemical Society, first gathering since the tragic happenings at Pearl Harbor, must be recorded as being highly successful. Yet conventions of the size of the A. C. S. do pose a number of questions during a war period when industry and our colleges and universities are being called upon to expand greatly the scope of their activities. The matter of censorship too and the dissemination of technical information that might be of aid and comfort to the enemy are practical considerations of utmost importance

Numerous suggestions were made at Memphis of one kind or another. One particularly, offered by a director of the society, seems to warrant serious thought. He would hold meetings at least for the duration in New York, Chicago or Atlantic City, eliminate all purely social functions, and leave all arrangements in the hands of a central office staff. The very serious problems of transportation and adequate hotel accommodations would be eased somewhat in any one of the three places mentioned; local groups would be relieved of the great burden of arrangements now specially difficult and time consuming There is still very definite need for the technical brains of the country to gather together for the exchange of ideas and information and largely of the off-the-record variety.

The Canadian Picture: War against common enemies has cemented still further the bonds of close friendship existing for a great many decades between the United States and Canada. Community of interests in such perilous times calls for very close cooperation in an industrial as well as a military sense, and suggests from a practical viewpoint a comprehensive exchange of information. Our neighbor to the north of us has been in the war now for three years and an examination of her business and industrial experiences should prove of distinct interest to us.

The matter of prices and wages control is an excellent example. Canada adopted an all-embracing "freezing" policy some months back, in an effort to stem the fatal effects of inflation. In the main it would seem that the plan is working with considerable success. Canadians, too, have been quite fearful that, unless the United States likewise adopted a very similar plan, they would experience considerable difficulty in holding to theirs.

Chemical Industries inaugurates with this issue a new monthly feature "The Canadian Review" (page 675), written by Kenneth R. Wilson, one of the best informed newspaper correspondents in Canada, and also an author of note whose articles are appearing regularly in MacLean's and the Financial Post of Toronto. Very logically, Mr. Wilson's initial contribution deals largely with the problems of prices and wages in a war economy and the interrelationship and dependence of the two countries on each other on these all important questions. In future issues Mr. Wilson will deal in part with chemical aspects of the Canadian war effort.

Inflation Controls: Message by the President, although it was merely a review and outline of the anti-inflation program, sharply focused attention on how the war is affecting us. It should be studied with interest by the nation.

There can be only wholehearted endorsement for the stated objective of guarding against wartime inflation. Drastic but necessary steps are now necessary.

As outlined by the President the program consists of seven points.

(1) Heavy taxation to limit war profits and to meet the huge sums being expended to win the war. Everyone agrees that heavy taxes are in order but they should not be confiscatory taxes to destroy the profit motive which has been the prime force in building industrial America.

In this taxation program the President included a recommendation that personal incomes be limited to $25,000 a year. It makes one wonder if this is a mere gesture to the unions, rather than a sound plan of taxation.

In any event large incomes are already highly taxed and the increased revenue from such a ceiling on personal incomes would be rather insignificant in the huge war program. However, every penny counts. Why not revise the income tax levy upward and leave out this talk of a $25,000 ceiling. Thus the results would be obtained without doubts as to the objective.

(2) The second point is the establishment of ceilings on prices. This part of the program was immediately taken care of by the General Maximum Price Regulation issued April 28 by the OPA. This is one of the most important and to date probably the best executed of all the components of the counter-inflation drive.

The overall freezing of prices and rents, etc., was drastic but necessary. The task of administering will be tremendous. There will probably be a hectic period of adjustment before a smooth-running program is evolved.

(3) The third point is stabilization of wages. Here there seem to be some discrepancies. The President is against any restraint on wages, although it would seem that this should go hand in hand with a program to make the price ceilings effective. The President says that our standard of living must come down but then he says that nothing should be done about the 40-hours week or overtime pay as this would adversely affect our standard of living.

It is estimated that consumers will have about $86,000,000,000 to spend this year while there will be for sale only $69,000,000,000 of goods and services. Demand will exceed supply by about $17,000,000,000. This means that consumers will compete which will in turn put pressure on the price structure. Stabilization of wages would be one method of helping to relieve such a condition.

(*Continued on Page 673*)

No. 6 in a series of advertisements about new research chemicals.

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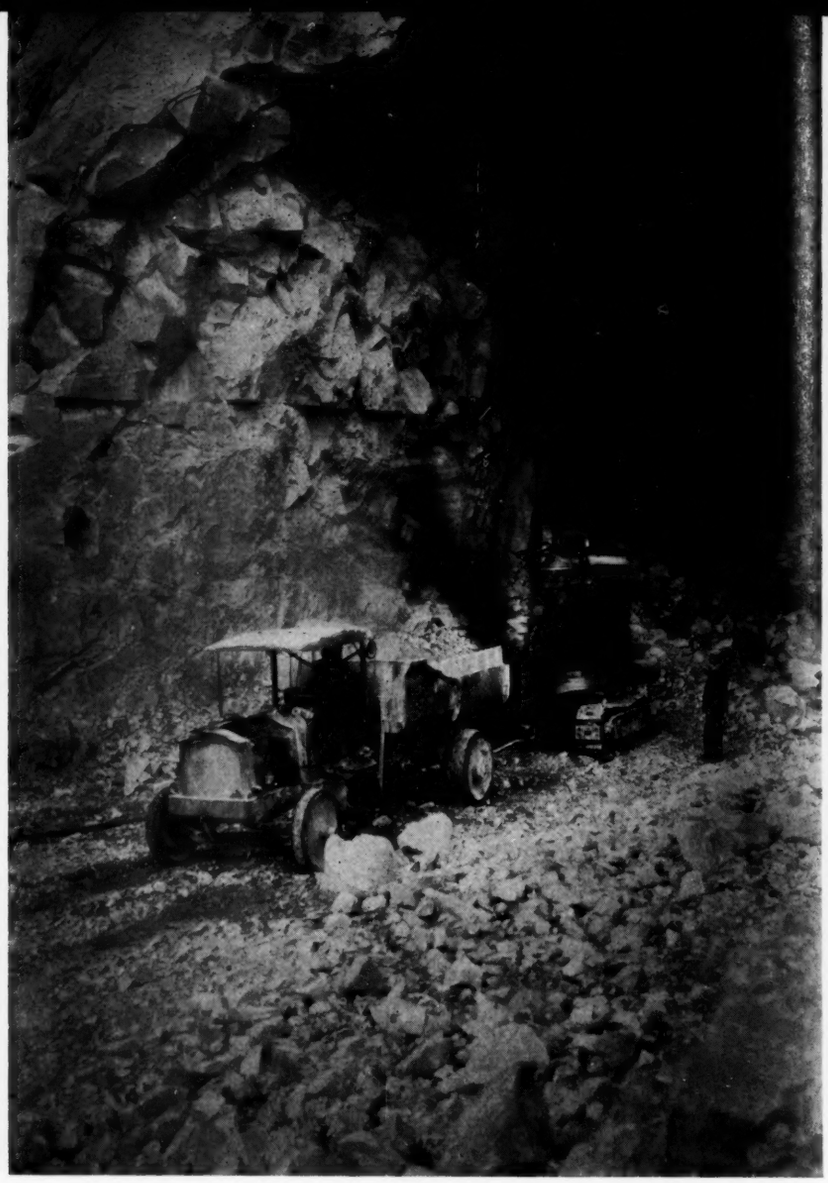


Trucks operating in limestone mine supplying crushed stone at Dunbar, Pa.

LIME

As a Chemical Raw Material

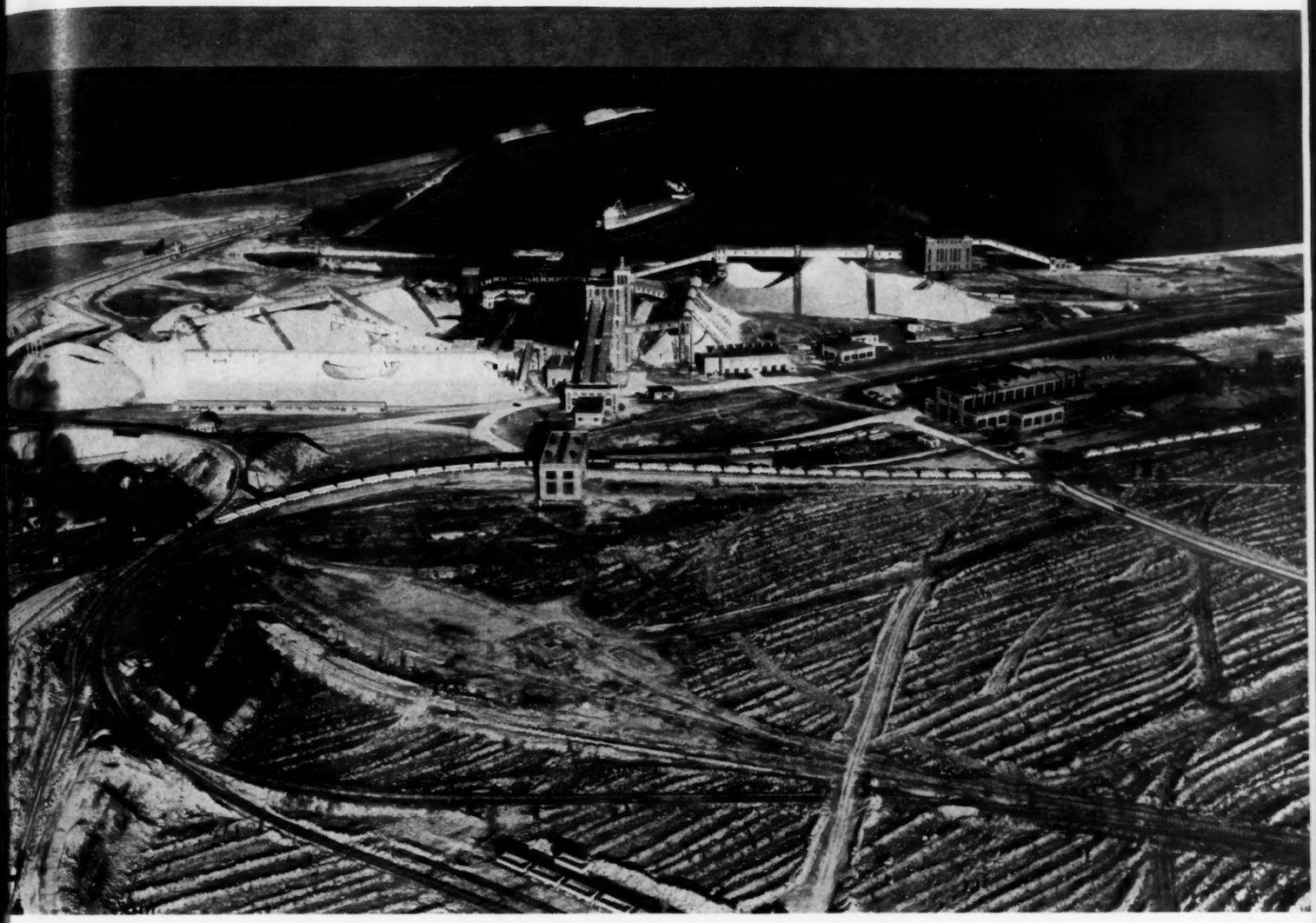
In Two Parts: Part One

By Wallace E. Wing
Marblehead Lime Co.

Our chemical engineer author has been employed by the lime industry since his graduation from Ohio State in 1922. He has covered all phases of construction, chemical control, research and production in the industry. His story will give you some startling facts about a chemical raw material which has always been taken for granted.

LIME as a chemical raw material has always been taken for granted and used with little or none of the fanfare that has been given to some of the other better advertised essential materials. The word "Lime" is used very loosely and in reality the term has a different meaning for nearly every industry. For the purpose of clarity we are confining our use of the term to the oxides or hydroxides of commercially calcined limestones. Much has been said and written about the variations between different limes and it is reasonable to expect to find differences because of the variations in the conditions under which disposition of the raw limestone took place. Further variations can be attributed to the calcination, type and size of kiln, method of operation, the fuel used, and last the conditions of use. The last usually involve the slaking of the lime to a putty or milk of lime suspension and occasionally to the dry hydrate as an intermediate step. Each of these variables is worthy of extended study and investigation.

Historically lime was one of the first chemical reagents used by man and the production of lime is almost as old as the use of fire. In the year 350 B.C. Xenophon records the sinking of a ship near Marseilles carrying a cargo of linen and lime required for its bleaching. Discorides and Pliny in 75 A.D. describe the production and use of lime and Discorides mentions the medical use of limewater. Some of the first investigations into the process of calcination or the attempts to explain the theory helped to explode the Phlogiston Theory. Joseph Black's elucidation of the nature of the calcination process showed that it consisted in the expulsion of fixed air. The Phlogiston Theory attributed the calcination to the introduction of



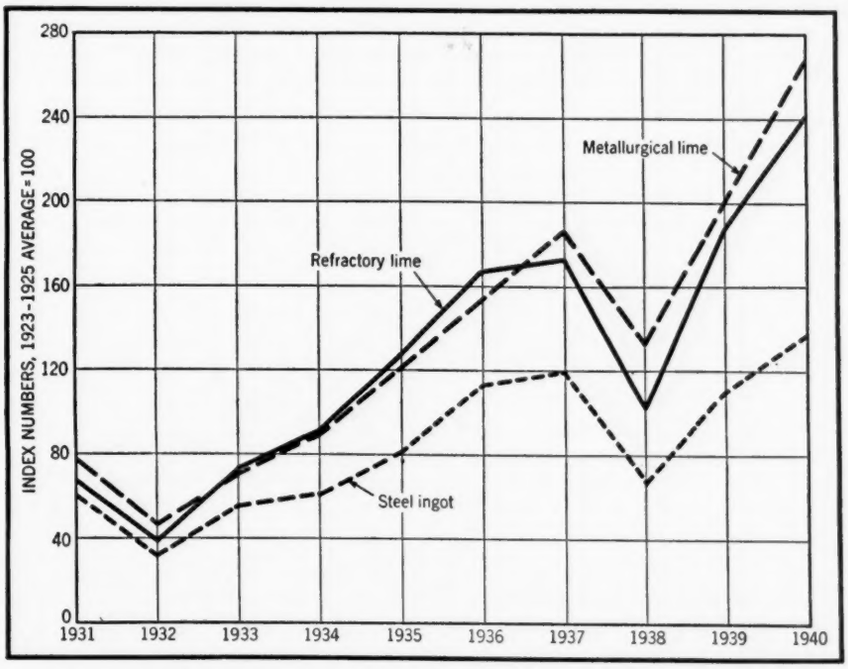
Airplane view of world's largest quarry operated by Michigan Limestone & Chemical Co., Calcite, Mich.
Copyright Abrams Aerial Survey Corp., Lansing, Mich.

phlogiston which rendered the lime "fiery" or "caustic." These same observations were later confirmed by Lavoisier.

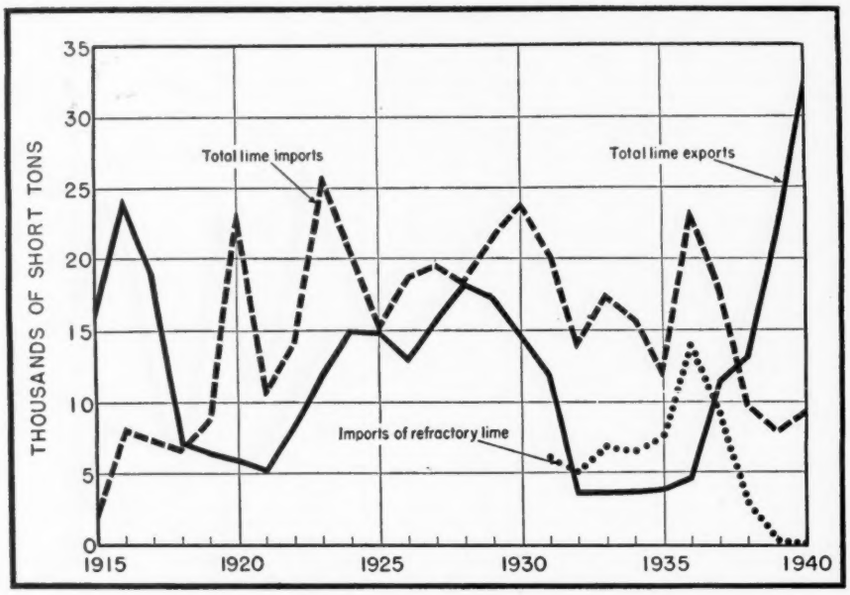
Trend in Lime Consumption

The production of lime reached a new peak in 1940 and will surpass that point for 1941. The metallurgical field advanced 33 per cent for 1940 compared with 1939. Refractory lime, paper use and water treatment all showed noteworthy advance. The increase in use of metallurgical lime was greater in proportion to the ingot steel production, more metallurgical lime was used per ton of ingot steel and the production curves show that the use of lime is increasing steadily.

The trend in imports of lime for our industrial needs has been downward for some time. Since the last World War we have used much less dead-burned magnesite as refractory lining material for open hearth. Part of this has been replaced by the domestic production of magnesite in the state of Washington. The production of clinkered dolomite in this country has taken the place of imported Austrian magnesite together with the dolomites that



Sales of metallurgical lime and refractory lime (dead-burned dolomite) compared with steel ingot production 1931-40. Index numbers for steel ingots computed by Federal Reserve Board from data of American Iron and Steel Institute. (Reprinted from U. S. Department of the Interior, Bureau of Mines Minerals Yearbook Review of 1940.)



Exports, total imports, and imports of refractory lime (dead-burned dolomite) 1915-40. Imports of refractory lime were not reported separately before 1931. Date from Bureau of Foreign and Domestic Commerce. (Reprinted from U. S. Department of Interior, Bureau of Mines Minerals Yearbook Review of 1940.)

have been fortified with other magnesium minerals.

Our exports of lime have increased recently because of the curtailment in shipping and they represent principally shipments to the Latin Americas and Canada. The South American countries have increased their imports from the United States to a large extent because of the curtailment in shipping and a change in attitude with respect to exchange of goods.

Quicklime is a semi-perishable material and as such does not stand storage for any length of time. Stocks are unimportant and production must be regulated to match consumption. However, the large consuming industries are regular steady consumers.

High calcium lime is a strategic material for the steel industry as a fluxing material in the open hearth and electric furnaces.

Dolomitic lime is the source of metallic magnesium in the Pidgeon process and much dolomite is used as refractory lime as well as in the manufacture of glass. Approximately one ton of magnesium metal is recovered from six tons of dolomitic lime.

Manufacture of Lime

Lime is produced from naturally occurring limestone and the stone deposits are carefully chosen because of physical and chemical properties as well as geographical locations. The chemical limestones are necessarily low in impurities such as silica, phosphorus, iron, alumina, and in the case of high calcium limestone the magnesia must be low. In most chemical limestones the combined impurities are less than three per cent total.

A large amount of the high calcium chemical limestone is mined by shaft or stope mining to enable the operators to keep the stone free from overburdened impurities which might become mixed with the stone in the stripping operation. A number of important deposits that are worked require shaft mining because the deposit is deep underground or tilted at such an angle that it would require the opening of too many faces for efficient operation. Workable ledges vary in thickness from a little less than an eight foot minimum to sixty and eighty feet. In the larger quarrying operations the stone is drilled and blasted for large shovel operation. The shovels load the stone into cars or trucks which haul it to the crusher where it is crushed and screened to proper size for calcination. The four to eight inch size is used for the shaft kiln and the smaller sizes are calcined usually in the rotary kiln. In a mechanical loading, crushing and sizing operation usually not more than sixty-five per cent of the quarried stone is of a size available for shaft or rotary kiln calcination. In quarry operations where there are intermediate seams or ledges that must be sorted out, it is necessary to resort to hand breaking and loading in the quarry. This practice is followed in the larger plants because the quantity of stone that is handled does not justify the expenditure for crushing facilities. In the hand quarry operation it is possible to recover as much as eighty per cent. of the quarried stone for kiln sizes.

Lime is produced or calcined for the most part in rotary kilns, shaft kilns and cupolas, while some recovery lime is calcined in furnaces of various kinds. A small amount of refractory lime is calcined on sintering machines.

The rotary kiln is a large producing unit having capacities in excess of 200 tons in 24 hours using for fuel, oil, gas, coal, wood and other solid fuels and combinations of fuels. The rotary kiln has the advantage of using small size stone, smaller than is practical to use in a shaft kiln. The calcination process takes place in a relatively short time. The stone travels from cold stone through the kilns to cold lime in a little over three hours.

Lime imported for consumption in the United States, 1939-40, by countries and customs districts[1]

Country	Customs district	1939 Short tons[2]	1939 Value	1940 Short tons[2]	1940 Value
Belgium	Florida	22	$101	....	....
	New York	228	1,052	....	....
	Loredo	22	103	....	....
Canada	Los Angeles	268	2,590	529	$4,913
	Me. and N. Hampshire	....	....	53	546
	Michigan	1	7	5	68
	St. Lawrence	19	174	92	362
	San Francisco	3,383	33,360	3,865	34,410
	Washington	3,653	32,541	4,641	41,039
Germany	New York	7	596	....	....
	Pittsburgh	[3]	66	....	....
Japan	Washington	[3]	12	[3]	11
Mexico	Laredo	43	108	....	....
Norway	Los Angeles	1	38	....	....
Sweden	Los Angeles	6	288	....	....
	San Francisco	....	....	3	120
Switzerland	New York	[3]	25	....	....
United Kingdom	New York	43	2841	17	419
		7,694	71,902	9,205	81,888

[1] Exclusive of dead-burned basic refractory material.
[2] Includes weight of immediate container.
[3] Less than 1 ton.
U. S. Bureau of Mines.

This produces a fast slaking lime and other desirable properties in the lime.

The shaft kilns are getting into the higher production bracket; some produce up to 80 tons in 24 hours. The shaft kiln uses a larger size stone all the way from three-inch to eight-inch in size. It is not desirable to burn a mixture of sizes because of the difference in burning lime required for the different sizes. If they are mixed the smaller stone will be overburned, the larger stone will contain core (unburned stone). Shaft kilns use as a fuel, gas, oil, wood, coal and producer gas. Sludge from the causticizing process is sometimes calcined in the rotary kiln and again in hearth-type furnaces such as the Hershoff. In this hearth-type of furnace usually a gaseous fuel is used for firing.

Lime exported from the United States, 1936-40

Year	Short tons Short	Value	Year	Short tons	Value
1936	4,601	$71,109	1939	21,477	$236,49
1937	11,300	122,895	1939	21,477	236,497
1938	13,222	121,662			

U. S. Bureau of Mines.

The High Temperature Process

Metallurgical—Open Hearth

It would be most presumptuous for this author to discuss the lime reactions in basic open hearth slag but there is scarcely a subject which has had more investigators or upon which more high grade talent has worked. Lime as calcium oxide essentially is added to the open hearth furnace to remove principally sulfur, silica and phosphorus. The pig iron or hot metal which forms a good percentage of the charge contains much silica which must be fluxed in order to remove it. Lime also unites with the phosphorus to aid in its removal. Lime is added at the end of the heat to increase the basicity of the slag and to prevent reversion of phosphorus. Lime for the open hearth must be low in silica, phosphorus and magnesia. The magnesia during the heat goes into solution and then before the heat is finished precipitates out or separates out and is present in the finished slag as Periclase, MgO. The damage to bottom lining in the open hearth takes place early in the heat at which time the magnesia goes into solution.

The proportions of silicon dioxide and calcium oxide are the main components of a basic slag but other factors have an important influence upon the result. Magnesia is always present from the wear of the hearth but it is undesirable as it makes the slag viscious and has less power to hold phosphorus than lime.

In the basic process there is difficulty in making a slag entirely of lime and silica, for this is more viscious than a slag of the same percentage of silica containing other bases. There is a tendency, therefore, toward the absorption of iron oxide, but this is opposed by a contest on the part of the lime for the possession of the silica and the result is a decrease in the percentage of iron when there is an increase in lime. The substitution of calcium oxide for ferric oxide produces a more viscious slag but this effect is due to the action of stronger forces. The more bases present the less necessity there is for an additional amount since the weight of silica remains constant, the reducing action of the metals come into play, the slag begins to be robbed of its iron, which at the time is its most reducible and its most fusible base. The presence of manganese oxide in the slag modifies without completely changing the reactions just described by furnishing an additional base and imparting greater fluidity. This also tends to render the presence of iron oxide less necessary. Fluidity is of vital importance because the slag must run freely from the furnace else it would build up the hearth and further it must be basic so it will not score the bottom. Fluidity and basicity determine the nature and the amount of lime addition.

Lime as produced for fluxing in the open hearth is sometimes clinkered with iron to increase the rate of solution and to speed the CaO-FeO equilibrium. There are some limestones containing several per cent of iron that are burned for fluxing and in the calcining process are burned at sufficient temperatures to form a sinter or clinker. The iron is usually present as calcium di-ferrite.

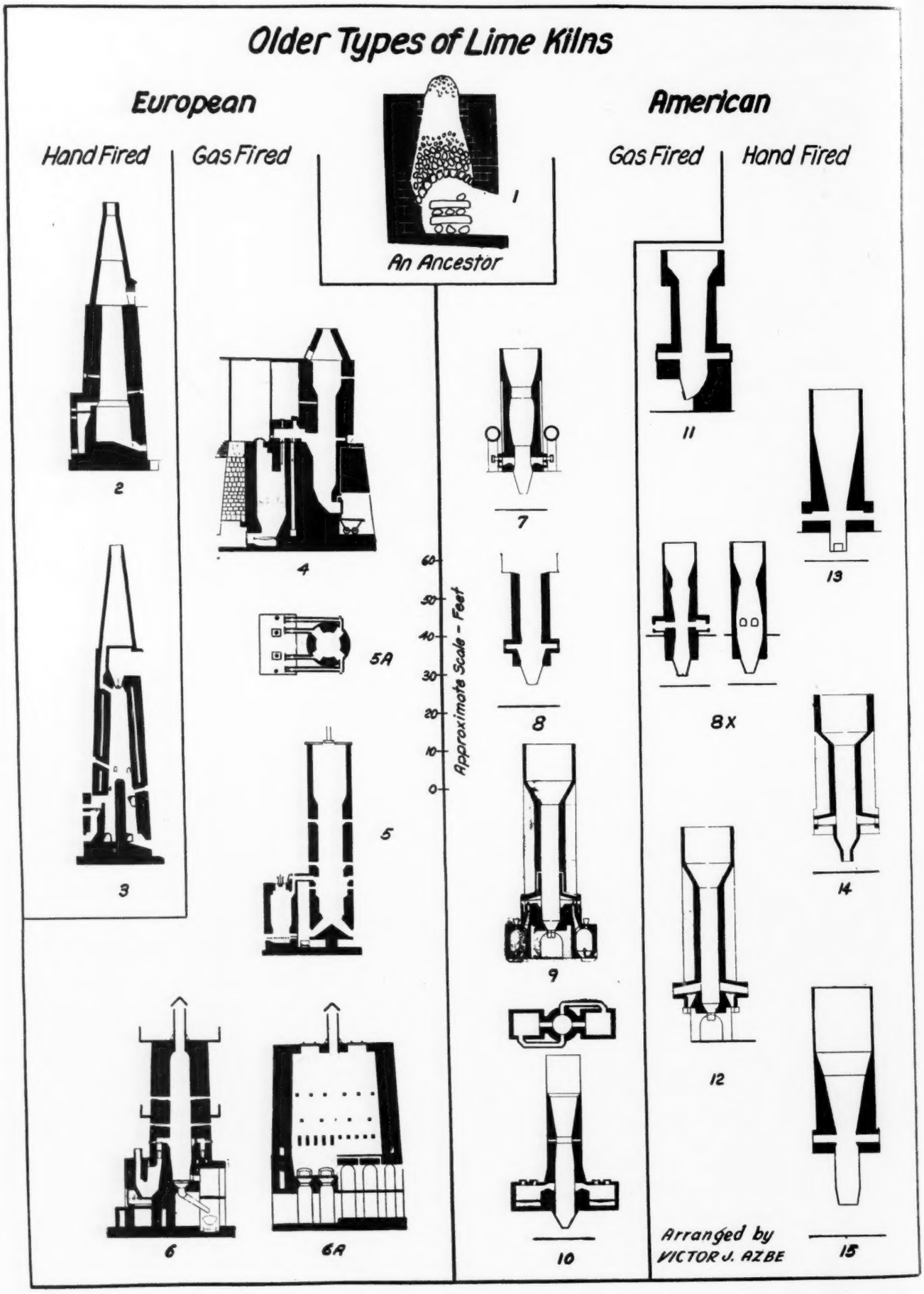
Lime exported from the United States, 1939-40, by countries

Country	1939 Short tons	1939 Value	1940 Short tons	1940 Value
Argentina	1	$2,613	41	$1,641
Australia	30	444	5	15
Brazil	24	462	55	1,272
Canada	8,714	74,261	4,843	29,276
Chile	15	392	29	623
China	....	....	35	1,750
Colombia	281	7,252	1,433	15,627
Costa Rica	1,001	10,067	3,510	32,170
Ecuador	62	1,645	132	2,315
El Ealvador	57	784	44	478
France	36	1,113	6	213
Guatemala	2,434	21,673	6,272	60,541
Honduras	3,146	27,096	9,469	85,039
Japan	1,386	32,042	145	4,764
Mexico	1,374	9,719	1,133	9,110
Netherlands Indies	2	43	67	979
Newfoundland and Labrador	....	....	101	1,087
New Zealand	30	391	14	352
Nicaragua	276	4,096	351	4,085
Panama	278	5,261	18,11	17,425
Peru	859	10,526	1,114	15,483
Philippine Islands	1	32	26	248
Saudi Arabia	100	1,856	....	....
Sweden	117	4,162	....	....
Union of South Africa	123	2,013	....	....
United Kingdom	290	9,719	499	16,249
West Indies:				
British	247	3,111	287	3,738
Cuba	148	1,908	122	1,739
Haiti	246	2,445	140	1,432
Netherlands: Curacao	32	296	101	1,022
Other countries	38	1,075	127	2,846
	21,477	236,497	31,912	311,619

U. S. Bureau of Mines.

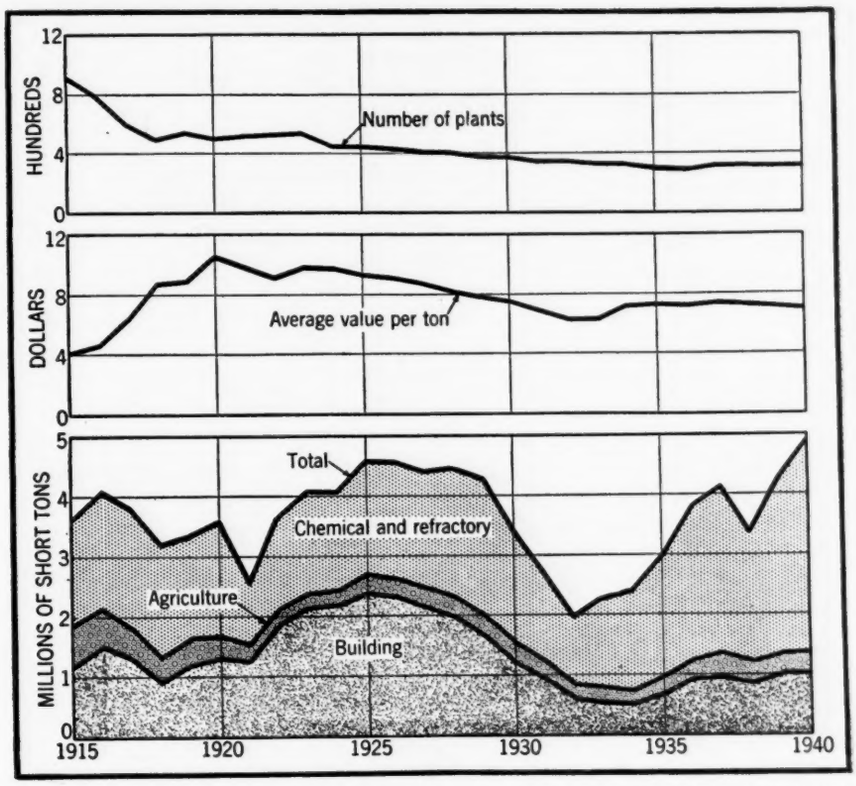
Refractory Lime

Lime as dead-burned dolomite and as raw dolomite is used as a refractory in the open hearth for patching between heats, to repair scored and washed spots in the bottom and damage due to mechanical action. Clinkered dolomite is more generally used for this purpose because it stays put and knits into the bottom due to the presence of the fluxing phase that is present in the clinkered material itself. The increased use of clinkered dolomite and refractory lime is well shown in the Bureau of Mines, Chart No. 1, which shows the increase in its use as compared to the increase in ingot steel production. The increased use is most noteworthy in the last two or three years. Dolomite refractories and particularly those in which the magnesia has been fortified by addi-


Older Types of Lime Kilns
European
American
Hand Fired
Gas Fired
Gas Fired
Hand Fired
An Ancestor
1
2
3
4
5
5A
6
6A
7
8
9
10
11
12
13
8X
14
15
Approximate Scale - Feet
60
50
40
30
20
10
0
Arranged by
VICTOR J. AZBE

tions of the other minerals such as Brucite (Magnesium Hydroxide) are fast replacing magnesite bottoms. One of the principal reasons for this is due to the ease and speed with which a bottom can be built. The newer bottom materials can be tamped into place with an air hammer and built up to sufficient thickness and burned in in one relatively short period of time, whereas, the magnesite bottoms were laid in thin layers and each layer burned in for considerable time before adding successive layers. The use of clinkered dolomite as a patching material in the open hearth has increased very rapidly since World War I because the Austrian magnesite could not be obtained.

The study and development of clinkered dolomite refractories has covered a period of years and much improvement has been shown in this art. The chemical requirements for clinkered dolomite for the open hearth call for a low silica, low phosphorus about 8 per cent. iron and alumina as flux and a well developed and shrunk periclase grain enveloped by the interstatial bonding material principally di-calcium ferrite. The interstatial bonding material is such that it will soften at the lower temperature of the open hearth to such an extent that it will become somewhat sticky. The specific gravity should be high so as to lessen the tendency to float in the iron bath. In the course of the use of this refractory material much of the lime (Calcium Oxide) is leached out in the metal bath leaving Periclase (Magnesium Oxide) as the real refractory material.

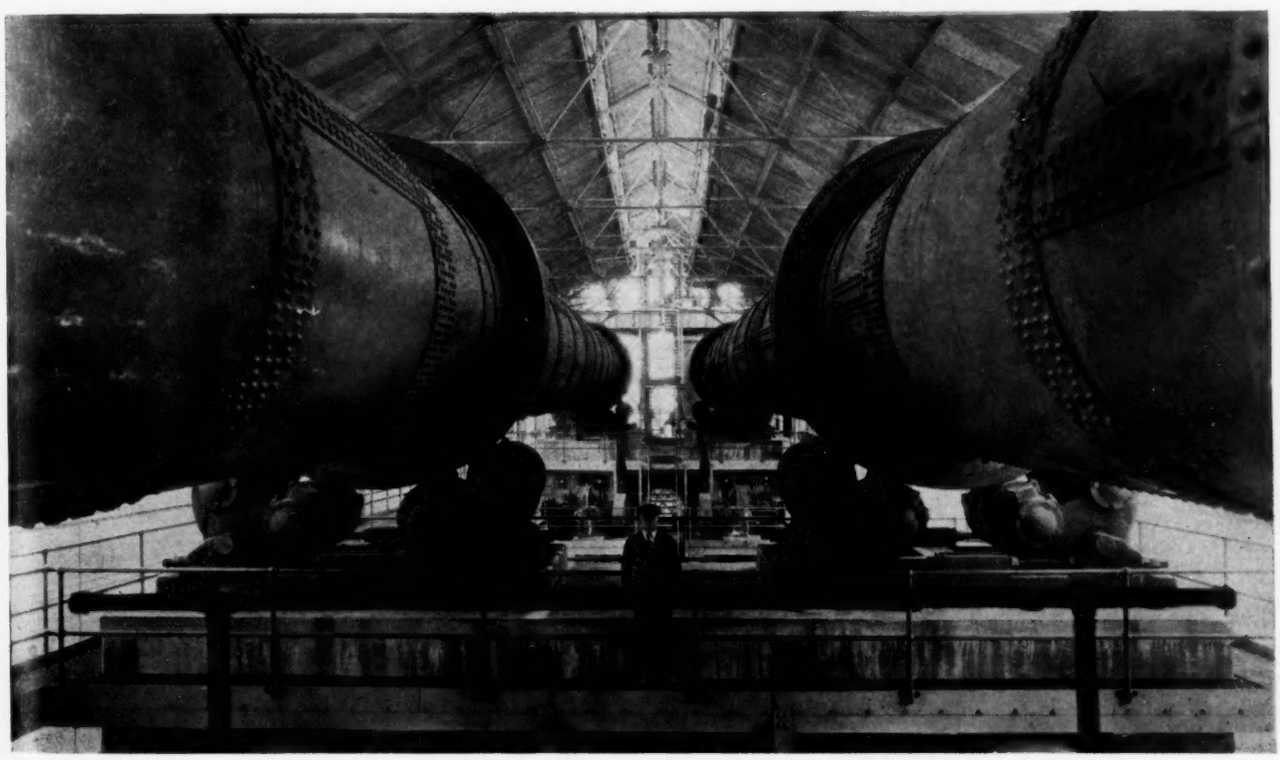


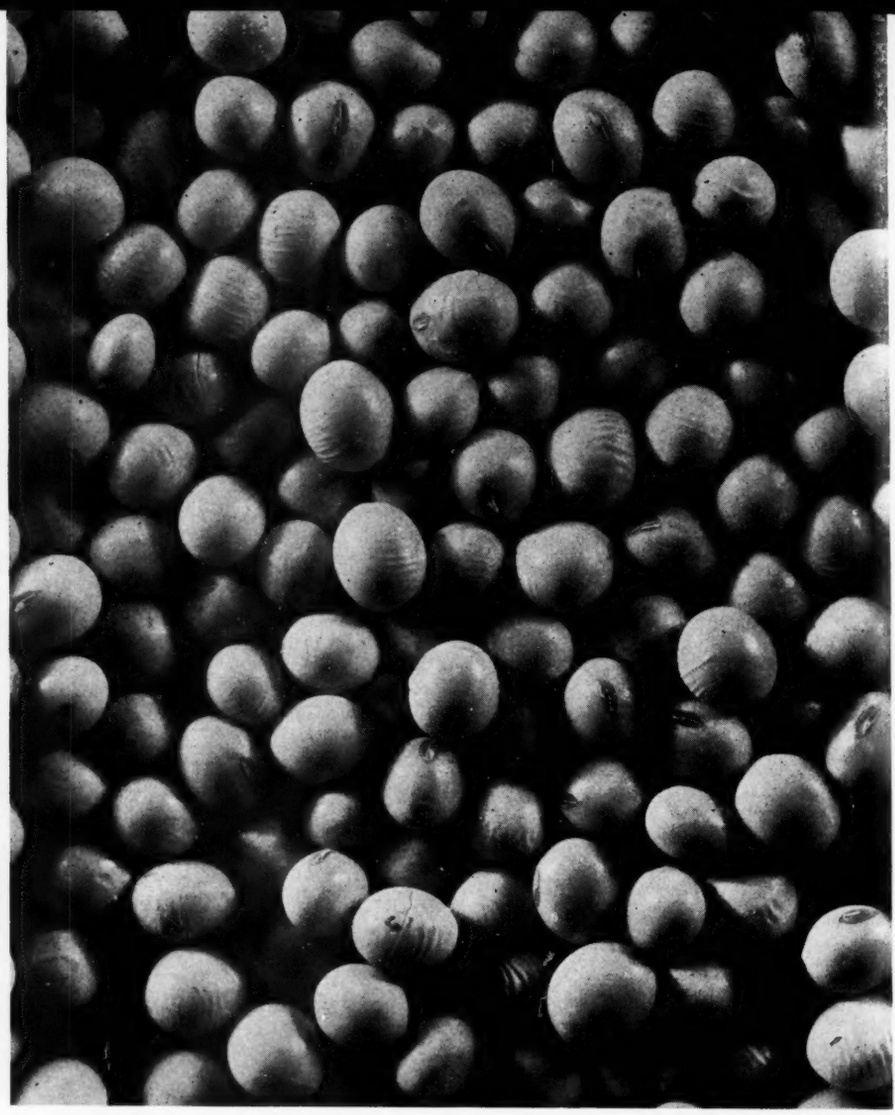
Trends in number of active lime plants, average value per ton, and principal uses, 1915–40. Bureau of Mines Minerals Yearbook Review of 1940.

Nearly all the clinkered dolomite is produced in rotary kilns and the burning or clinkering temperatures are quite high, 2900° F. to 3000° F. in order to get greater shrinkage of the grains. The material is small in grain size, most of it is minus ⅜-inch down to ⅛-inch with very little fly dust to clog the checker work. A well graded product produces a better patch because it leaves few voids to aid in solution in the bath of hot metal to slag.

Part Two will appear in the June issue.

Interior of rotary lime kiln plant, Marblehead Lime Co., Chicago.





Mukden soybeans magnified approximately two diameters. Photo by the Soybean Digest, courtesy Armour & Co.

THE AMERICAN BALANCE SHEET IN OILS AND FATS

In Three Parts
PART TWO

By **Walter J. Murphy,**
Editor, Chemical Industries

In his second chapter, the author of this review shows that we do not lack either a tremendous variety of fats or the ways and means of producing them in tremendous quantities. Yet we will face many serious problems in the war years to come, and it may be a few years before they are solved.

"MR. and Mrs. America," to borrow a phrase from one of the best known newspaper columnists, will be quite impressed to learn that 84 pounds of fats and oils are consumed by every man, woman and child in this country each year. Not all as food, to be sure, but in one way or another 130 million Americans managed to make about ten billion pounds of fats disappear. Nor is the figure of 84 pounds the whole story for it does not include much of the fats physically consumed as food. Indeed, it only includes butter, lard, shortening, margarine, salad oils, etc.

Of a stupendous total of ten or eleven billion pounds approximately 80 to 85 per cent normally is produced domestically and the balance is imported.

It is the latter—this business of importing some billion and a half pounds of fats annually—that riles up a great many people—politicians, farmers, some economists and very naturally those hybrids, the chemurgists. One of these writes: "Oil is a subject bristling with absurdities. Denmark exports butter and imports oleomargarine. The Mediterranean nations export olive oil and import corn oil and cottonseed oil. The United States grows more cotton than it can use and buys cottonseed oil abroad. We have become the world's greatest consumers of animal and vegetable fats and oils, and despite our unquestioned ability to produce these raw materials on our idle acres, our imports of them are exceeded only by our imports of rubber."

And when these billion and a half pounds of imported fats are translated into money value—several hundred million dollars annually—then the chemurgists wince still further.

There are many reasons, or let us say causes, why even in the United States with potentially unlimited production resources, we both export and import fats but normally wind up year after year with a debit balance. The first and possibly the most important is that of custom, or, perhaps, it could be described better by the word lethargy. Second, fats are not entirely interchangeable. Olive oil is not corn oil, nor corn oil is not olive oil, and cottonseed is different from either olive or corn. We have not reached that stage of scientific progress where we can produce willy-nilly, a single basic oil cheaply and then manipulate it into products that will rival in physical and chemical properties the several hundred different fats and oils now consumed in large quantities in industry. Finally, cheapness of labor in certain parts of the world works against wider introduction of the cultivation in this country of many oil-bearing plants and trees. Possibly World War II will give a decided impetus to the movement to make this country entirely self-sufficient in fats and oils. Possibly World War II will even bring about an equitable division of sunlit lands among the principal nations of the world, advocated so forcibly by William J. Hale, father of chemurgy, and the question of the balance sheets of fats and oils of the countries of the world will cease to be a matter of importance—of even life and death.

Importance of Vegetable Fats and Oils

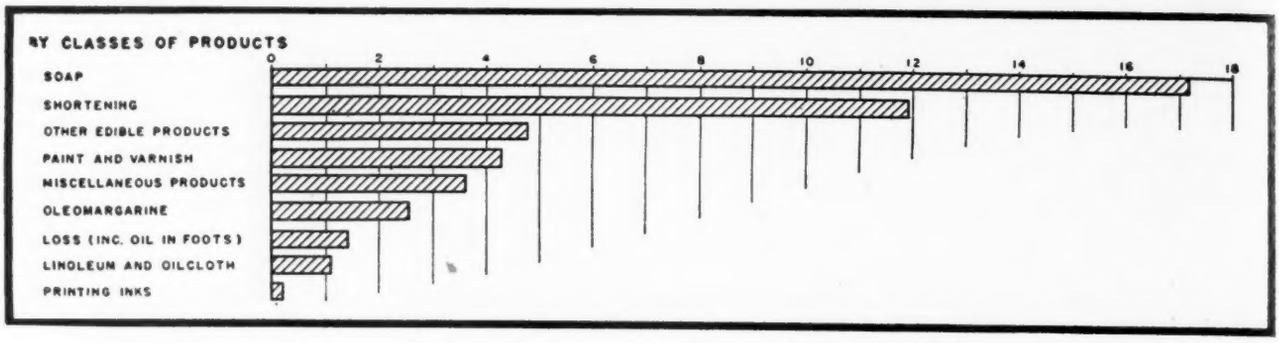
If we exclude butter and lard (food uses) then the quantity of vegetable fats consumed in industry far exceeds the consumption of animal or fish fats and oils. Since this discussion is not primarily directed at the food angle, but to the industrial uses of fats, it is logical to start with a detailed study of the principal vegetable oils.

Cottonseed Oil. Certainly from the production viewpoint cottonseed oil obtained from the seed left after removal of the fiber for textile and other industrial manufacture is the most important of the vegetable oils. Some billion and a quarter pounds were made in 1940. About 90 per cent of present consumption is in the food industries. In 1940 this was distributed approximately as follows: 68 per cent shortening; 10 per cent in margarine; and 22 per cent in other edible oils. There has been little relative change in the quantity of oil consumed in inedible products. Impressive as this figure of a billion and a quarter is we find that production of cottonseed oil was much greater in the twenties. The reason for this is not hard to find—the Federal Administration's policy of deliberately curtailing cotton growing. When "King Cotton" is ailing its offspring very naturally is affected. Cottonseed oil is consumed in very large quantities in the manufacture of shortening, margarine and the so-called cooking and salad oils. Cottonseed oil accounted for 57 to 88 per cent of the annual consumption of all fats and oils entering into shortening in the period 1931-40.

Cottonseed oil really came into prominence when David Wesson perfected a process for deodorizing the oil and thus permitted it to compete with lard. Hydrogenation made possible the use of cottonseed and other oils in the manufacture of such lard "substitutes" as the well-known "Crisco."

Manufacture of lard substitutes began on an important scale about 1870. In the intervening years the methods and raw materials have changed considerably, but since 1920 approximately 80 to 90 per

Exterior view of Woburn Degreasing Co. showing railroad siding on left and large storage tanks on the right for cottonseed, linseed, palm, cocoanut and soybean oils.



The soap industry led all others as a user of fats and oils during 1940. (vertical lines indicate 100,000,000 lbs.)

cent of the total raw materials has been cottonseed oil.

There are about six methods of preparation, but the most popular types from the consumer's viewpoint are either from blends of unhydrogenated and fully hydrogenated vegetable oils, or vegetable oils hydrogenated to the desired consistency. Of course whether large or small quantities of tallow are used in formulating depends upon the relative price structures of tallow, cottonseed and other vegetable oils. Further, there is, of course, direct competition with the price of lard. The maker of the "substitute" must "cut his cloth" to this measure.

Since 1920 the cooking and salad oil industries have grown by leaps and bounds. Products in this group include oils refined and prepared for general culinary purposes, mayonnaise and other dressings, and sandwich spreads. The very definite requirements of these industries make mandatory oils that are liquid at both winter and summer temperatures, with reasonable keeping qualities and of medium consistency with ability to emulsify readily.

Traditionally, the preferred salad dressing is olive oil, but the economics of the situation work against its use. Cottonseed is the principal oil used. For this purpose it must be "winterized," that is, its stearin content must be removed by pressing to prevent cloudiness in cold temperatures. Corn is often used to replace cottonseed in winter months.

Price-wise the effect of using cottonseed in such large quantities in various food products has been to raise it out of the class of soap oils (except the foots sold as soap stock). Cottonseed was not considered a particularly good soap oil because of a tendency to go rancid easily.

Cocoanut Oil. The 1940 importation either as oil or as the raw material expressed as oil amounted to some 980 million pounds. We import more cocoanut oil than any other single fatty oil. Cocoanut because it is high in lauric acid (40-50 per cent), a necessary constituent of free lathering soaps, is highly prized by the "soaper." The manufacturer of margarine also finds it very acceptable.

The cocoanut palm (*Cocos nucifera*) grows on or near the coastlines of the Atlantic and Pacific tropical seas. Because of the peculiar tax setup instituted by the present Administration in the early days of the last depression our supplies for a decade have come almost entirely from the Philippines. Other points of supply are Ceylon and the Dutch East Indies.

Linseed Oil. This oil is obtained from the seeds of the flax plant (*Linum usitatissimum*) cultivated in the United States, Canada (North America six per cent of the total), Argentina (50 per cent), Russia (20 per cent) and India (13 per cent), and to smaller extent in several other countries. It is a drying oil and is the one consumed in the greatest quantities for this purpose. The usual procedure of treatment is pressing flax seed, although solvent extraction is also employed. The "raw" oil is very often "boiled" in order to clarify it and to improve its drying properties. This is done by heating the oil in a closed vessel to about 250° C. The fatty acids in linseed are linoleic and linolenic and in about equal proportions.

Broadly the consumption in the United States can be broken down percentagewise somewhat as follows: printing ink four per cent; linoleum and oil cloth 12 per cent; paint and varnish factories 44 per cent; and non-factory consumption (mostly by painters) some 40 per cent.

From the economics point of view since we are a large importer of flax it would seem to follow that price-wise the market in this country will largely be dictated by the international price situation. The United States consumes only about one-quarter of the world's entire consumption.

Soybean Oil. Until comparatively recent years supplies of soybean oil came largely from Manchuria. In the past decade or so we have really "gone to town" in making the legume, *Soja max*, an important domestic crop. Soybean is a slower drying oil than linseed and roughly only about ten per cent of the total is used as a drying oil. The largest tonnage goes into edible products. Research chemists are giving a great deal of attention to soybean and many varied products are being made. We have even seen an automobile body produced out of soybean "plastics." The expansion in the soybean crop in the United States is one of the greatest joys of the chemurgists and one at which they point with great pride.

Soybean oil has become increasingly important to the soaper. In 1935 the industry used but two and a half million pounds of oil and about five million pounds of foots, in 1940 consumption rose to almost 18 million pounds of oil and 21 million pounds of foots. Thus in the short space of six years use of the oil by American soap interests increased fourfold. Unquestionably 1941 figures will show still greater gains and 1942 totals a still greater jump, because it is to soybean that soapers will turn in part to make up the losses of imported soap oils.

Soybean oil is very rapidly approaching linseed as this country's second most valuable domestic vegetable oil. Soybean is one of two American farm crops, the other is peanuts, which has increased in value in years when the total farm income was decreasing. The American farmer is now very much "soybean minded."

Approximately 80 per cent of soybean goes into edible materials, leaving 20 per cent for technical purposes. Soybean meal is widely employed as a protein supplement in the feeding of livestock and poultry, also in making fertilizers, plastics, glues, human food and celluloid substitutes. The oil is consumed in large quantities in the manufacture of paint, varnish, linoleum, oilcloth, printing ink and soap.

As more soybean oil goes into edible products more foots become available to the soaper. Soybean is largely used in soap plants in the production of soft soaps of several kinds and for special purposes, such as soft automobile soaps and liquid soap concentrates.

Chinawood or tung oil. This very

important drying oil is produced from the nuts of the tree, *Aleurites fordii*, and the overwhelming proportion of the world's supply, and of which we use a very large part, comes from China. We are building in the South a domestic industry that is very promising and in time may succeed in making us independent of outside sources.

Momentarily, however, we are being embarrassed on supplies. First it was the Jap-Chinese War and now it is a Pacific War. Imports declined in 1940 and 1941.

Tung oil has always commanded a premium over other drying oils for the reason that aside from oiticica it is the only vegetable oil containing what the chemist terms conjugated double bonds. To the layman its peculiar chemical makeup means that it imparts characteristic waterproofness, fast drying, and durability to those coatings formulated with it. To these characteristics might also be added greater hardness of its dried film and its great compatibility with various synthetic resins.

Next to soybean tung production is the most promising oil crop on the American horizon. When and if domestic production becomes larger it may tend to stop the speculative ups and downs that the foreign material continually goes through —in short, it may put a ceiling on foreign tung oil. On the other hand, domestic producers may ask for some tariff protection so that a "floor" may also be one result of the introduction of a domestic production.

Castor Oil. This product long known as a non-drying oil has become within the past few years quite important to the coatings fields for the chemist has again performed one of his well-publicized miracles—"making something seem what it ain't." That "mysterious" person has found a way of dehydrating castor oil. When that is done the resulting product possesses excellent drying characteristics. This is important when much of our supplies of drying oils are temporarily in the hands of an enemy. The only hitch is a lack of any appreciable size crop of castor beans in the United States. Steps are being taken, however, to increase the domestic crop of the castor oil plant, *Ricinus communis*.

Castor oil is consumed in large quantities in the manufacture of sulfonated oils important in the textile and tanning industries. Castor is widely used as a plasticizer; to some extent it is employed in lubricant formulation; and, of course, where is the little boy or girl who would not with a long face be able to tell one very important use?

Oiticica Oil. Threatening shortages of tung oil have provided the background for oiticica oil to assume greater and greater importance. It is obtained from the nut of the oiticica tree, *Licania rigida*, growing profusely in Brazil. The United States is currently taking most of the output and will, unquestionably, take all it can get, for the oil in its drying properties closely resembles tung. It was not until 1936 that the oil was listed separately in Government import statistics and in that year only three million pounds came in. By 1940 the total had increased to nearly 16 million and 1941 and 1942 should show further sharp increases.

Babassu Oil. This material in certain characteristics resembles cocoanut (both have about a 45 per cent lauric acid content), and if large quantities were immediately available would be a very happy solution of our present dilemma on cocoanut oil. There is little likelihood that we can hope for any such solution overnight.

The potentialities for much greater use of this Brazilian product are tremendous. Many difficulties must be overcome, however, before such a status is achieved. Gathering of the nuts represents a real problem for the trees are largely in dense jungles in the states of Naranhao and Pirauhy. From a mechanical viewpoint the babassu nut is one of the hardest nuts to crack (literally speaking!). Transportation and labor are major problems.

Soap: United States factory consumption of fats and oils used in the manufacture thereof, calendar years 1931-40

	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940[1]
	Quantity (million pounds)									
Animal fats and oils:										
Tallow: Inedible	523.7	549.2	508.8	662.9	663.0	660.0	613.5	702.3	785.0	786.5
Edible	1.5	2.0	2.4	1.1	1.4	.2	.2	.3	.4	.7
Grease	129.4	143.7	124.7	142.8	98.1	98.7	94.2	96.3	120.9	256.9
Other animal fats and oils	.4	.6	.5	.5	.4	.4	.4	.4	.4	1.3
Total	655.0	695.5	636.4	807.3	762.9	759.3	708.3	799.3	906.7	1,045.4
Marine mammal and fish oils:										
Fish	58.4	49.1	52.2	64.5	110.0	128.0	123.9	79.9	115.0	88.7
Marine mammal	68.7	48.9	44.9	34.0	28.4	32.6	65.1	66.1	51.5	19.2
Total	127.1	98.0	97.1	98.5	138.4	160.6	189.0	146.0	166.5	107.9
Vegetable oils:										
Coconut	340.5	353.5	322.3	341.1	229.7	307.4	252.2	343.0	388.9	396.9
Palm	172.2	168.0	188.0	154.7	87.3	78.5	141.4	91.6	102.1	84.9
Babassu	....	....	....	....	....	9.0	14.3	8.3	37.6	41.2
Soybean	3.8	5.6	4.2	1.4	2.5	5.0	10.3	10.9	11.2	17.6
Sulfur oil, or olive foots	39.0	30.9	31.9	30.4	31.5	24.0	18.0	15.0	19.1	14.9
Corn	4.1	2.5	3.6	6.3	2.8	2.5	2.4	2.5	4.4	3.6
Cottonseed	2.0	3.6	7.0	2.7	1.9	1.3	8.4	2.9	1.1	3.0
Olive oil, inedible	2.1	1.9	2.0	2.0	1.7	1.6	.9	1.3	1.4	1.6
Linseed	1.5	1.0	1.0	1.0	1.2	1.5	1.4	1.4	1.8	1.5
Castor	2.8	2.4	2.1	1.8	1.1	1.6	2.1	1.8	.9	1.2
Palm-kernel	28.0	3.6	6.3	16.5	37.2	26.4	111.5	29.5	3.7	.2
Sesame	8.2	1.9	.8	.5	.7	1.9	2.9	.3	[2]	[2]
Rapeseed	....	[2]	[2]	1.0	8.0	7.8	1.0	.1	[2]	[2]
Sunflower	....	....	7.9	7.1	.1	.1	[3]	[3]	[3]	[3]
Other vegetable oils	3.9	7.0	.7	2.1	5.8	6.0	11.7	14.6	8.3	2.7
Total	608.1	581.9	577.8	568.6	411.5	474.6	578.5	523.2	580.5	569.3
Grand total	1,390.2	1,375.4	1,311.3	1,474.4	1,312.8	1,394.5	1,475.8	1,468.5	1,653.7	1,722.6
	Percent of total quantity									
Animal fats and oils:										
Tallow: Inedible	37.7	40.0	38.8	45.0	50.5	47.4	41.6	47.9	47.5	45.7
Edible	.1	.1	.2	.1	.1	[4]	[4]	[4]	[4]	[4]
Grease	9.3	10.5	9.5	9.7	7.5	7.1	6.4	6.6	7.3	14.9
Other animal fats and oils	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	[4]	.1
Total	47.1	50.6	48.5	54.8	58.1	54.5	48.0	54.5	54.8	60.7
Marine mammal and fish oils:										
Fish	4.2	3.5	4.0	4.3	8.4	9.2	8.4	5.4	7.0	5.2
Marine mammal	5.0	3.6	3.4	2.3	2.2	2.3	4.4	4.5	3.1	1.1
Total	9.2	7.1	7.4	6.6	10.6	11.5	12.8	9.9	10.1	6.3
Vegetable oils:										
Coconut	24.5	25.7	24.5	23.1	17.5	22.1	17.1	23.4	23.5	23.0
Palm	12.4	12.2	14.3	10.5	6.7	5.6	9.6	6.2	6.1	4.9
Babassu	....	....	....	....	....	.6	1.0	.6	2.3	2.4
Soybean	.2	.4	.3	.2	.2	.4	.7	.7	.7	1.0
Sulfur oil, or olive foots	2.8	2.2	2.4	2.1	2.4	1.7	1.2	1.0	1.1	.9
Corn	.3	.2	.3	.4	.2	.2	.2	.2	.3	.2
Cottonseed	.1	.3	.5	.1	.1	.1	.5	.2	.1	.2
Olive oil, inedible	.2	.1	.2	.1	.1	.1	.1	.1	.1	.1
Linseed	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
Castor	.2	.2	.2	.1	.1	.1	.1	.1	.1	.1
Palm-kernel	2.0	.3	.5	1.1	2.8	1.9	7.5	2.0	.2	[4]
Sesame	.6	.1	.1	.1	.1	.1	.2	[4]	[4]	[4]
Rapeseed	....	[4]	[4]	.1	.6	.6	.1	[4]	[4]	[4]
Sunflower	....	....	.6	.5	[4]	[4]	[3]	[3]	[3]	[3]
Other vegetable oils	.3	.5	.1	.1	.4	.4	.8	1.0	.5	.1
Total	43.7	42.3	44.1	38.6	31.3	34.0	39.2	35.6	35.1	33.0
Grand total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Preliminary. [2] Less than 50,000 pounds. [3] Included in other vegetable oils.
[4] Less than 0.05 percent.
Source: United States Bureau of the Census, Animal and Vegetable Fats and Oils.

Making copra. This is the smoking and drying platform. Crushed half-nuts are placed face down and allowed to dry. When there is only 10 to 20% moisture left, the product is copra. Courtesy, Philippine Refining Corp.

Much depends on the outcome of the present war in the Pacific. A Far East under Jap influence might make it highly desirable to start plantations of several kinds in Brazil, including babassu. But let's not believe such a thing possible.

Palm Oil. Two important oils are derived from the West African oil palm, *Elaeis guineensis*, palm oil and palm-kernel oil. Unfortunately large quantities are regularly imported from the Dutch East Indies, Sumatra and Malaya. Thus the soaper's headache is not alone confined to the problem of securing a suitable substitute for cocoanut. Appreciable quantities of palm-kernel ordinarily find their way into edible products. Large quantities of palm oil are normally consumed in the tin-plate industry as a protective coating against atmospheric oxidation of the hot metal. But if the Japanese have been so unkind as to cut off a considerable portion of our palm oil supplies they have also very obligingly seen to it that we will have no tin. Very thoughtful to say the least, Mr. Tojo!

But for what tin we do and will have in the future we probably can use hydrogenated cottonseed or hydrogenated peanut oil in place of palm.

Other Vegetable Oils

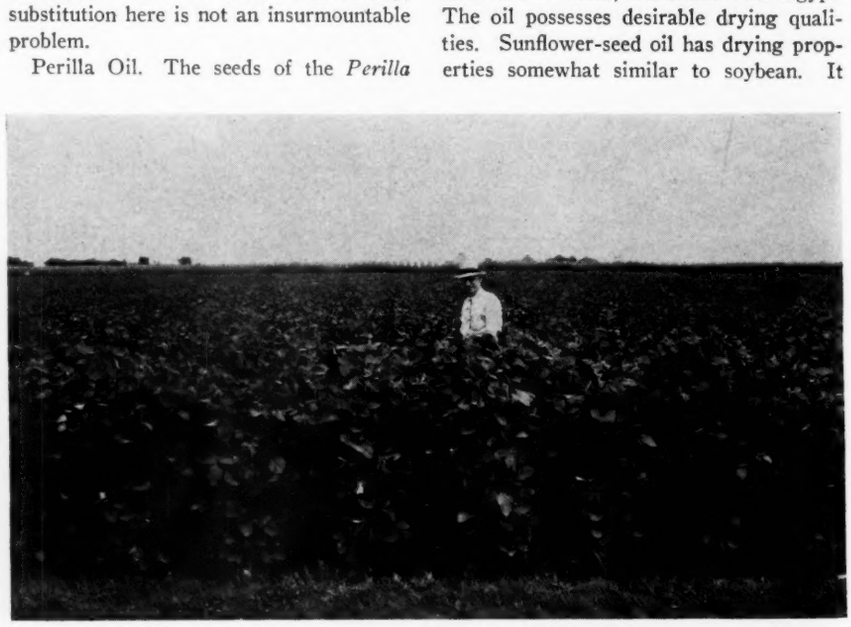
Corn oil and peanut oil are two important domestic oils. Still greater dependence must be placed on these now that serious interruptions have occurred in the normal international flow of trade in fats and oils. This is specially so of peanut oil. To the uninformed it may come somewhat of a surprise to learn that we have been a steady importer of peanut oil for years to the tune of about three million pounds. Apparent consumption of peanut (domestic and foreign) shows that in 1940 we consumed some 55 million pounds in the food industries, about five million in soap, and two million in miscellaneous manufacture products. Fortunately, chemurgists have been singing the praises of peanut crop culture now for several years so that it will not be a difficult matter to quickly step up our output of oil.

Olive oil, a typical example of a non-drying oil, offers a difficult problem too. It finds application as a cooking and salad oil, in the manufacture of high-grade toilet soaps. The sulfur oil and the foots are employed in making sulfonated oil products. Our dependence on outside sources is complete. Fortunately, substitution here is not an insurmountable problem.

Perilla Oil. The seeds of the *Perilla ocymoides*, cultivated in China, Manchuria, Japan, Korea, and India, supply us with a valuable member of the drying oils family. Attempts have been made to grow crops in the United States but with little or no success. Like tung, the war in China and now the spread of the conflict to Japan and the United States has played hob with supplies getting through. Some figures will illustrate. Our 1936 imports totaled 117,903,000 pounds, while in 1940 we brought in but 11,347,000 pounds! Just another deficit in the balance sheet on fats and oils to be made up in some other way. But how? He who has an immediate and entirely satisfactory answer can write his own ticket!

Perilla is an excellent example of the complexity of the fats and oils picture. In 1929 it accounted for but a fraction of one per cent of our total consumption of drying oils. By 1936 it accounted for 13½ per cent of the total! In the latter part of '36 a domestic excise tax was placed on perilla and this "killed" much of the incentive for its widespread use. In the fats and oils industry it is very often a case of the "King is dead—long live the king."

Hempseed, from the seed of the plant, *Cannabis sativa*, is a drying oil of minor importance with the raw product cultivated in Europe, Russia, India, and China. Little to be hoped for here in the way of substantial increases in supplies. The same thing is true of poppyseed oil, obtained from the seed of the plant, *Papaver somniferum*, cultivated in Europe, India, China, and in a much smaller way in other parts of the world. Some attempts have been made in the United States to cultivate the plant, *Carthamus tinctorious*, from whose seed safflower oil is obtained, but the largest growing sections are in India, Turkestan and Egypt. The oil possesses desirable drying qualities. Sunflower-seed oil has drying properties somewhat similar to soybean. It



Field of soybeans, somewhere in the U. S. Courtesy Armour & Company.

is obtained from the plant, *Helianthus annus*, and is grown to some extent in the United States. Russia is the largest producer. Walnut oil, obtained from the nut of the tree, *Juglans regia*, has drying properties, but sources of supply are very uncertain and insignificant. War in the Far East makes any detailed discussion of sesame (teel) oil simply academic for our supplies came from China and Japan.

Mention should be made of the growing commercial importance of tall oil, a vegetable oil, a byproduct of the manufacture of paper pulp, and often called liquid rosin. Increasing quantities are coming on the market in crude and distilled grades and it is high in fatty acid content. Tall oil is employed in insecticide sprays, core oils, waterproofing, emulsifiers, coal dust sprays, etc. It offers distinct possibilities in formulating yellow laundry soaps.

The Animal Fats

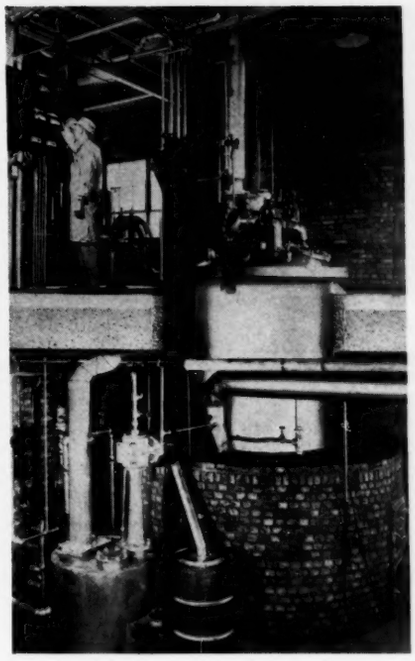
Academically the animal and fish oils are usually considered as one group; in commerce they are generally treated as two separate and distinct groups. The animal oils and fats are obtained from both land and water animals. If the animal fats and oils are derived from marine sources they are commercially considered in the fish group, the outstanding oils of this classification being the liver oils, chiefly cod; blubber oils, such as whale and sperm; body oils from menhaden, sardine, salmon, etc. The hair-splitting debate whether a whale is a fish or an animal is simply ignored by the oils trades, and in defiance of biology, whale oil is a fish oil here.

All animal fats and oils of terrestriai origin are byproducts. This is a pertinent fact in fats economics. The animal fats differ in this respect from those of vegetable origin, for while some of the latter are byproducts, others are main or principal products.

We discuss rather freely lard, tallow and grease, yet if asked to define each, many would find it rather difficult to do so. Fats from hogs are called lard if edible, and grease is inedible. The part of the animal from which the lard is derived and the method of rendering are the governing factors in assigning grades. The highest grades are obtained by vigorous agitation of the minced fat with warm water in special agitators or rendering kettles.

The best grade is known as Neutral Lard No. 1, obtained from the leaf fat of the animal and finds its principal use in the oleomargarine industry. In the rendering process, however, not all the lard is recovered, but by cooking in digesters and employing higher pressures and temperatures the remainder is made available and is usually designated as Leaf Lard.

Neutral Lard No. 2 is made in exactly the same way as Neutral Lard No. 1, except that the raw material is the back fat. The residue of Neutral No. 2 is known as Kettle-rendering lard. Still a fifth grade, made from the trimmings, is designated in the trade as Prime Steam Lard because higher temperatures and pressures are employed than for the first four grades. The residue from Prime Steam Lard is classified as grease.



Soybean fatty acids are combined with other materials and cooked in this large still (Armstrong Paint & Varnish Works) to produce new synthetic type varnishes. Photo shows a still of the larger size which occupies two stories.

Grades and Origin of Grease

Grease, really inedible lard, is produced from packing-house offal, from waste collected from butchers, hotels, etc., or from dead animals. It is commonly graded by color or origin, viz., white, yellow, brown, house, garbage, etc. White and yellow packing-house greases are usually of hog fat origin. Brown grease is usually derived from beef and mutton fat.

Previous to the introduction of the rigid Federal Government inspection of the larger slaughter houses engaged in interstate commerce, much of that which is now sold as grease was sold for edible use. By law such greases must be denatured in one of several prescribed methods.

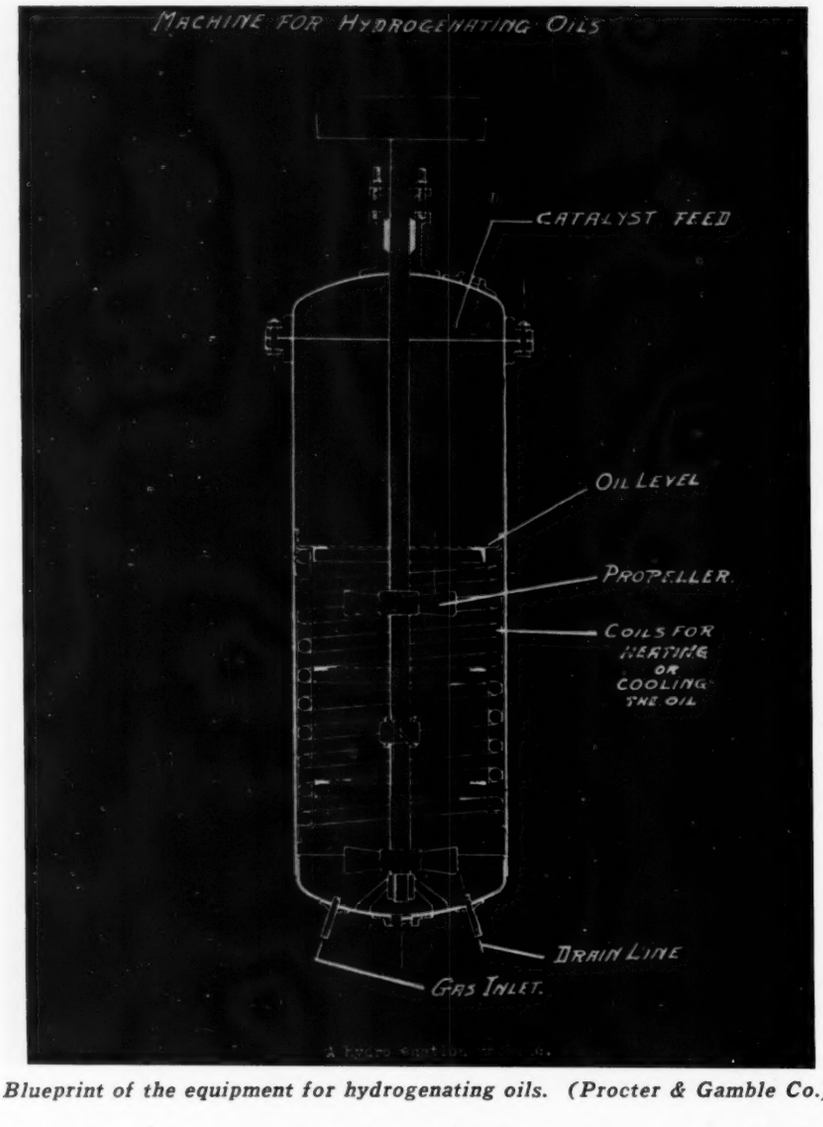
Grease produced from the residue of food from butcher shops, hotels, restaurants, etc., is usually designated as "Garbage Grease" to denote its origin and to distinguish it from Packing House Grease which, as just noted, is largely, if not entirely, of hog origin. Grease derived from dead animals is generally called "Horse Oil."

Tallow is the fat from cattle and sheep.

Paints, varnishes linoleum, and printing inks: United States Consumption (estimated) in the manufacture thereof, 1931-40

Commodity group	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940[1]
	Quantity (million pounds)									
Animal fats and oils—total	1	[2]	1	1	1	1	1	1	1	1
Marine animal oils—total	27	20	22	25	32	40	44	30	43	46
Vegetable oils:										
Linseed[3]	471	354	376	409	465	478	571	480	549	575
Tung[3]	90	74	102	117	129	115	143	87	103	67
Perilla[3]	11	11	25	24	60	105	39	41	51	19
Soybean	9	12	14	13	18	17	17	19	28	37
Castor	2	2	2	3	4	5	8	6	12	25
Oiticica[4]	....	....	....	....	....	3	4	5	19	16
Coconut	[2]	[2]	[2]	[2]	[2]	1	1	[2]	1	1
Other[5]	1	1	2	3	4	11	2	4	6	9
Total	584	454	521	569	680	735	785	642	769	749
Grand total	612	474	544	595	713	776	830	673	813	796
	Percent of total quantity									
Animal fats and oils—total	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Marine animal oils—total	4.4	4.2	4.1	4.2	4.6	5.1	5.3	4.4	5.2	5.8
Vegetable oils:										
Linseed[3]	77.1	74.6	69.0	68.8	65.2	61.6	68.7	71.3	67.5	72.2
Tung[3]	14.7	15.7	18.8	19.7	18.1	14.8	17.3	13.0	12.7	8.4
Perilla[3]	1.8	2.4	4.6	4.0	8.5	13.6	4.7	6.2	6.3	2.4
Soybean	1.5	2.4	2.6	2.2	2.5	2.2	2.1	2.8	3.5	4.7
Castor	.3	.3	.5	.5	.6	.6	.9	.9	1.4	3.1
Oiticica[4]	....	....	....	....	....	.4	.4	.8	2.3	2.0
Coconut	[6]	[6]	[6]	[6]	.1	.1	.1	.1	.1	.1
Other[5]	.1	.3	.3	.5	.3	1.5	.4	.4	.9	1.2
Total	195.5	95.7	95.8	95.7	95.3	94.8	94.6	95.5	94.7	94.1
Grand total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Preliminary. [2] Less than one-half million pounds.
[3] Since drying oils are used directly as well as in factory consumption, these figures represent total domestic disappearance excluding small quantities reported by the Bureau of the Census as used in soap, shortenings, and miscellaneous products.
[4] Imports for consumption from official records of the Bureau of Foreign and Domestic Commerce. Not classified separately prior to 1936.
[5] May include some oiticica oil prior to 1936. [6] Less than 0.1 percent.
Source: "The Fats and Oils Situation," Bureau of Agricultural Economics, U. S. Department of Agriculture.



Blueprint of the equipment for hydrogenating oils. (Procter & Gamble Co.)

Again the source of the raw material determines the grade and to a great extent the use. Because of its characteristically strong odor sheep fat is rarely employed for food, but finds markets in the soap, candle, and lubricating industries. In contrast, beef fat is used for edible as well as inedible purposes.

The fat from the kidneys and related organs, or suet, is employed to make the best grades of edible tallow and these are usually termed here oleo stock and abroad "premier jus." Such a product is produced by heating the shredded chilled fat alone and at comparatively low temperatures. Tallow for inedible purposes is produced by digestion with water and is known as rendered beef or rendered mutton tallow.

If oleo stock or rendered tallow is expressed they yield solid tallow or oleostearine and oleo oil. Oleo oil from premier jus (known as Oleo Oil No. 1) is used in margarine, but the inedible grade, known as Oleo Oil No. 2 is used in soap or in certain types of lubricating materials. The stearin is used in soap manufacture or in candle making. The soap industry is the largest user of inedible tallow.

A low-grade fat is worked up from the bones of sheep and cattle as a byproduct of the operation of obtaining the gelatine content as glue. Bone fat largely is used in soap-making. Wool fat or wool grease is obtained, of course, as the name implies from raw wool which contains about 20-30 per cent of fatty and kindred matter. When highly refined it is called lanolin.

With mention of just one more type of animal fat we will just about complete a review of everything but the famous "squeal." Hooves of cattle, sheep and horses are rendered by digestion with water in the course of manufacture of glue and an oil is produced which goes under the name of neat's foot. In England it is known as trotter oil. It finds wide application in leather-dressing, waterproofing compounds, and, when specially refined, it finds limited use in the formulation of lubricants for very fine and delicate machinery.

Neat's foot, often written neatsfoot, is sold in several grades, Pure, No. 1 Extra, and Cold-Pressed.

The United States, of course, is by far the largest producer of animal fats and oils. The famous stockyards district of Chicago is the headquarters of the animal fats industry of this country.

The Position of Lard

Lard is waging a defensive market war along a number of different fronts. The chief competitor is the so-called lard compounds which began to be employed in a serious way as far back as 1870. At that time and for many years later they sold as adulterants of lard and consisted chiefly of tallow or beef stearin. Later, cottonseed oil was employed and by 1890 most of the brands contained just sufficient lard to give the characteristic flavor. Hydrogenation was successfully introduced in 1908 permitting an oil to be changed into a solid fat. These products are sold entirely under brand names. They may or may not contain animal fats depending upon the relative costs of cottonseed and other vegetable oils, but all are predominately cottonseed oil. For this reason a very definite relationship has come to exist between lard and cottonseed oil prices. Any tinkering with the economic structure which throws the two out of normal relationship leads to serious consequences. Lard and lard compounds are continually in open competition. First one and then the other gains temporary advantage as the prices of corn (fed to hogs), hogs, cottonseed, and the competitive vegetable oils shift. But there is never any truce.

The hydrogenated compound manufacturers have obviously advanced their cause remarkably in the last 25 years. By intelligent and consistent advertising they have turned what was a disadvantage (lack of the characteristic smell of lard) into a distinct selling point, namely that their products are tasteless.

A word or two should be left for indicating the commercial position of stearic acid. It is widely distributed in the lards and tallows and it is from these that the article of commerce is generally obtained. This animal-derived fatty acid is employed in large quantities by manufacturers of stearates (so-called metallic soaps), in the production of driers, candles, polishes, cosmetics, etc. There are several grades but probably the most important are: double pressed distilled, double pressed saponified, and triple pressed distilled. Still another product of commercial importance is red oil which is a mixture of two fatty acids, oleic and oleinic. It finds application in a wide variety of industries including paint driers, ointments, candles, soaps, hair oils, polishes, tanning, etc.

Marine Animal and Fish Oils

Members of this classification are highly prized members of the fats and

oils industry even though actual tonnages used fall far below the consumption of vegetable and animal fats.

To the layman codliver oil is perhaps the most widely known. Generations have been fed the oil in one way or another and this long before science had really discovered that it was the very high vitamin A and D content that really was the potent factor. An inedible grade, known as cod oil, is used extensively in the leather trade for dressing hides. Most of the codliver and cod oils are brought in from Norway in normal times. Newfoundland is an important source of cod oil.

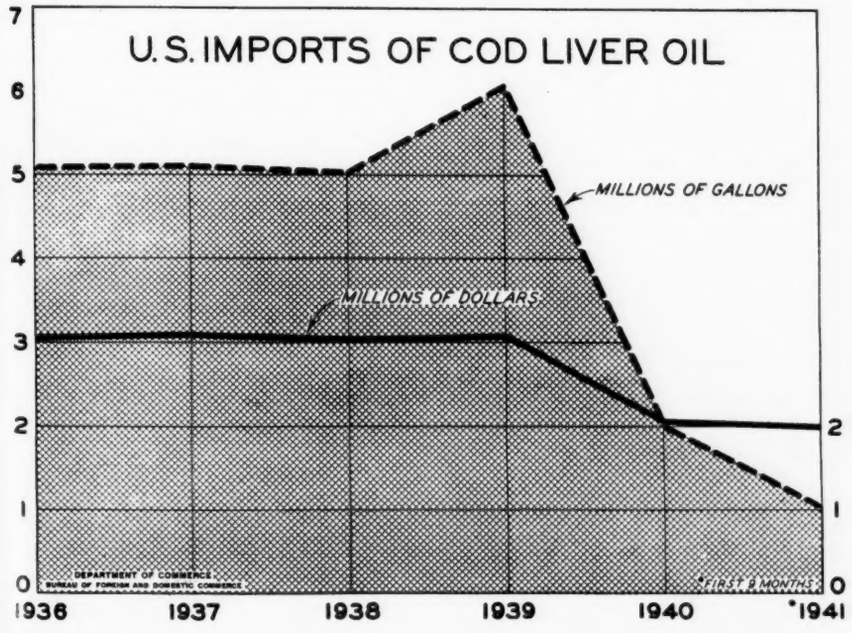
Jap fish oil, menhaden oil, herring oil, pilchard oil, sardine oil, and salmon oil are the principal fish oils of commerce and industry. They are produced by digesting the whole fish in water with open steam or by expression. In commercial practice the scrap remaining is dried and enters the fertilizer industry because of a high nitrogen and phosphate content. The fats from these oils all resemble each other very closely and in turn they are all somewhat akin to cod. They find application in treatment of leather, as a substitute for linseed in the linoleum industry, in the manufacture of soft soaps, and when refined they are used in coatings as a drying oil. The crude oil is very high in saturated acids and an unpleasant odor. Refrigeration removes much of the saturated acids and the so-called "winterized" oils have iodine numbers of 190 to 200. Fish oils account for approximately four to five per cent of the total consumption of drying oils in this country. The immediate economics of prices, etc., will naturally cause this figure to shift somewhat. The biggest single use for fish oils is still in soap production. Chemists, however, are making excellent progress in improving the technical qualities of fish oils and the future may see larger quantities consumed as a "drying oil." Whether they will seriously challenge the position of linseed and tung is open to debate.

Fats, oils, and oil-bearing materials: United States exports, 1931-40

(In thousands of pounds)

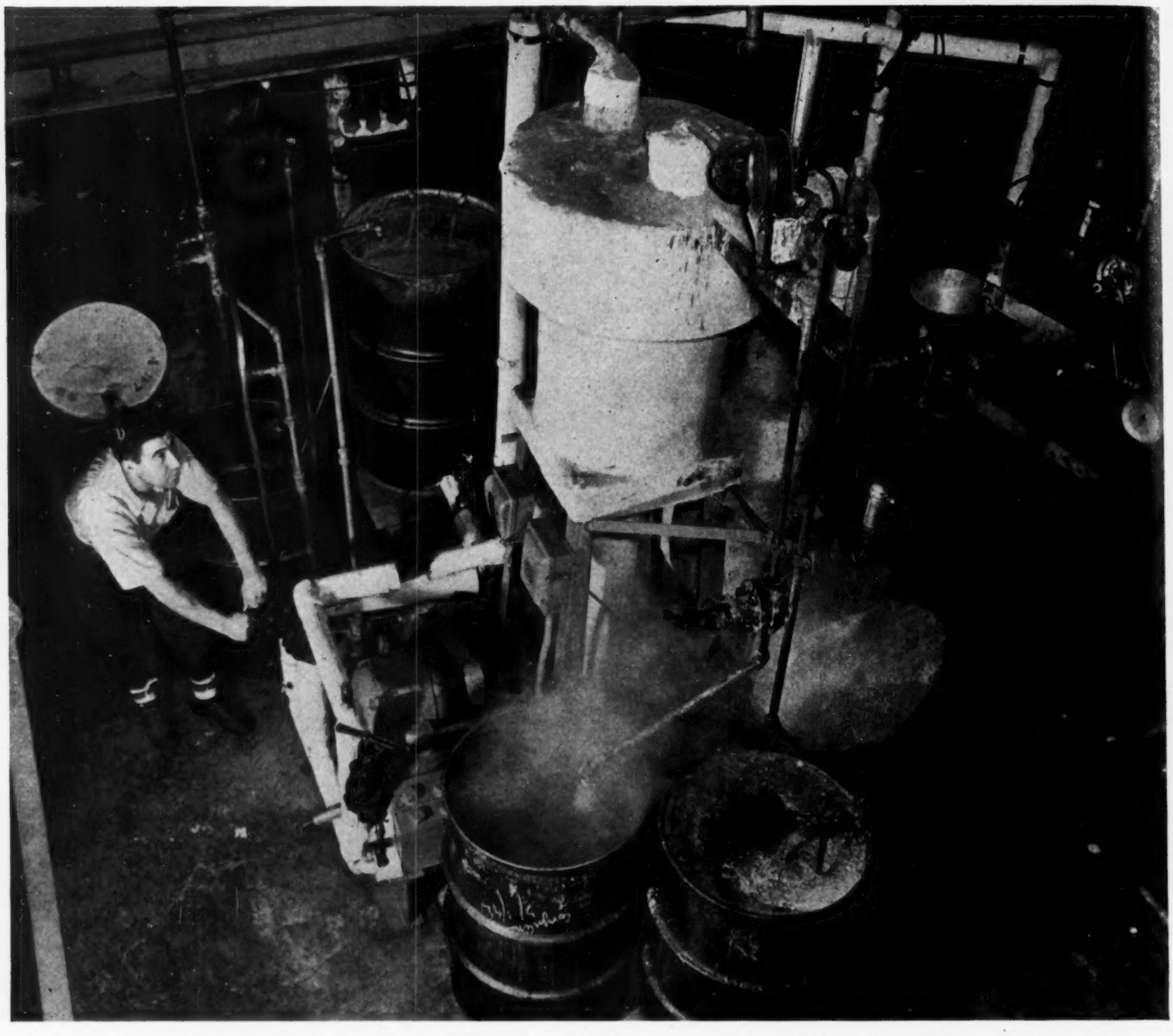
Commodity	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940[1]
Animal fats and oils:										
Butter	1,984	1,605	1,191	1,220	958	826	800	1,959	2,308	2,942
Lard and neutral lard	578,296	552,154	584,238	434,892	97,359	112,168	136,778	204,603	277,272	201,304
Tallow, edible and inedible[2]	2,665	2,511	6,839	7,347	536	3,521	1,149	729	2,318	2,133
Oleo oil	47,323	42,409	33,783	20,713	9,251	9,131	5,711	5,360	5,466	1,334
Oleo stock	7,924	7,075	8,633	5,979	3,378	3,616	2,656	2,874	4,894	1,637
Oleo stearin	6,842	7,534	6,273	4,255	1,261	1,153	601	181	153	89
Grease stearin	3,850	1,428	942	623	1,092	1,348	384	891	544	1,559
Neat's-foot oil	1,022	803	1,079	1,151	887	707	907	845	615	438
Other animal oils, inedible	1,144	1,928	1,833	1,267	4,047	880	771	505	1,174	697
Other animal greases and fats	75,286	56,940	70,054	55,708	14,731	11,449	3,415	1,899	2,285	3,473
Total	726,336	674,387	714,865	533,155	133,500	144,799	153,172	219,846	297,029	215,606
Marine animal oils:										
Fish	1,598	1,477	5,849	6,364	3,276	2,154	1,949	2,677	[3]16,533	4,149
Vegetable oils:										
Coconut[4]	18,266	23,684	26,221	25,123	12,328	17,745	9,023	7,228	26,038	40,501
Corn	776	960	1,026	1,314	833	929	444	113	180	205
Cottonseed[5]	23,544	56,589	36,135	15,331	4,091	3,149	7,591	4,872	13,645	15,126
Linseed	1,094	842	828	653	986	973	987	890	2,566	4,770
Peanut	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	325	2,853
Soybean	4,551	2,647	1,569	2,040	4,111	3,954	5,748	6,412	12,111	15,954
Castor oil, medicinal[7]	561	335	342	432	318	654	634	572	1,348	1,290
Other vegetable oils and fats	8,371	3,409	2,066	3,314	2,900	7,757	4,832	6,786	13,841	16,743
Total	57,163	88,466	68,187	48,207	25,567	35,161	29,259	26,873	70,054	97,442
Total primary fats and oils	785,097	764,330	788,901	587,726	162,343	182,114	184,380	249,396	383,616	317,197
Oleomargarine of animal or vegetable fats	547	474	288	369	128	108	163	235	264	1,030
Cooking fats, other than lard, of animal or vegetable origin	5,994	3,498	2,602	2,181	1,219	1,623	1,723	2,255	3,237	3,805
Oleic acid	1,068	876	1,587	2,837	513	511	182	194	1,129	2,034
Stearic acid	367	511	462	676	419	485	391	294	1,252	3,296
Vegetable soap stock[8]	24,894	18,303	18,609	17,274	14,964	19,396	10,363	8,560	11,472	9,117
Soybeans	[6]	[6]	[6]	[6]	[6]	[6]	76,241	158,680	627,741	146,465
Other oil-bearing materials	13,936	250,295	23,792	5,800	92,863	109,179	9,923	2,730	9,734	5,222

[1] Preliminary.
[2] Inedible tallow included in "Other animal greases and fats," 1931-35.
[3] Includes 14,254 thousand pounds of whale oil.
[4] Crude plus refined converted to crude by dividing by 0.94.
[5] Crude plus refined converted to crude by dividing by 0.93.
[6] Not separately reported.
[7] Converted from gallons on the basis of 8 pounds per gallon.
[8] Includes vegetable fatty acids, acidulated oils, and foots.
Source: Compiled from official statistics of the U. S. Department of Commerce.



Herring and sardine oils are produced quite generally throughout the world. The headquarters of the salmon industry is along our Pacific Coast, while menhaden is the oil of a fish of the herring type found in large shoals off the North Atlantic Coast and the city of Baltimore is often said to be menhaden headquarters. Jap fish oil is derived from a fish somewhat like small herrings or sardines, and, as the name implies, the Japanese control because of the matter of geographical location.

The present World War is very naturally affecting the fishing industry and the repercussions already have been tremendous and will, indeed, become quickly accelerated as the actual military operations increase in intensity and spread over greater and greater areas of the seven seas. Can we then hope to solve our fats and oils deficit problem from the



Woburn Degreasing Co. produces in this apparatus a substitute for tung oil (Chinawood oil) which is no longer available. Product is conjugated linseed oil known to the trade as Conjulin. Yearly deficiency of tung oil is estimated at about 100,000,000 pounds.

depths of the sea? Hardly, until we win complete control of old Neptune.

Whale Oil—Marine Animal

In the marine animal oils class whale oil is in position number one. The employment of "mother" ships in hunting whales has increased the supplies of whale oil tremendously in the past quarter of a century and the same operation likewise threatens the early extinction of whales. Modern extraction processes have been introduced and in England and in Europe large quantities of whale oil have gone into fat hydrogenation processes. There are five grades of whale oil marketed, running from No. 0 Grade to No. 4 Grade and the relative quality of the grades are in the same relationship.

Considerable quantities of whale oil go into leather and soap. Quite naturally the European upheaval in 1939 brought about a cessation of most, if not all, of the world's whaling operations. It is said that "It is an ill-wind that doesn't blow somebody some good." Perhaps somewhere in the wild North Atlantic at this very moment whales are in convention assembled and are amid tremendous fanfare and blowing of geysers passing resolutions endorsing Mr. Hitler!

The remaining so-called marine animal oils are of but minor importance today. Seal oil, used so widely for hundreds of years in lighthouses, has surrendered to technical advances. It and dolphin or porpoise oil find but very restricted uses in this age of modernization.

What About the Balance Sheet?

From the foregoing pages it is evident that we do not lack either a tremendous variety of fats nor the ways and means of producing them in tremendous quantities. Yet we will, unquestionably, find many serious problems and difficulties arising to plague us in the war years yet to come. The chemist and the engineer will solve many for us, but probably not all of them in the next few years. But in a word we will hardly suffer privation, but rather inconveniences. We will not starve, nor should we suffer from malnutrition, but we probably will "cuss" at a soap that doesn't lather well and "storm" at a paint that fails to last out a second winter. Our shoes may not have that "soft" feel to them and our homes and offices may take on a very drab appearance. But Sherman described it all quite eloquently some 80 years ago when he said "War is hell!"—and that was in the day of the smooth bore cannon and long before man became so presumptuous as to believe he could imitate the birds in the air and the fish in the sea.

Part three, the conclusion, will appear in the June issue.

The Best Defense Against *Submarines*

Depth bombs play havoc with America's undersea enemies. After listening devices locate the submarine, the charge is set to explode at that depth—causing water pressure to cave-in the submarine's sides.

The Best Defense Against *Waste*

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CLOSURES

AMERICAN FLANGE & MANUFACTURING CO. INC., 30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

Personalities at the Memphis Meeting of A.C.S.

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C.I.'s roving photographer took the photographs on this and the two following pages of personalities at the 103d meeting of the American Chemical Society at Memphis, Tenn., the week of April 18.

(1) Left to right, P. J. Carlisle, R. & H. Chemicals Division, Du Pont, Niagara Falls, N. Y.; Arthur Good, E. B. Badger Sons Co., Boston; Prof. Donald B. Keyes, on special leave from U. of Ill. for work in Washington. (2) Mr. and Mrs. W. J. Podbielniak, Podbielniak Centrif. Super Cont. Co., Chicago. (3) Prof. E. T. McBee, Purdue University. (4) Dr. C. W. Rippie, Solvay Sales. (5) M. B. Geiger, assistant general plant manager, Oldbury Electrochemical, Niagara Falls. (6) Prof. C. J. Robinson, Pomona College. (7) J. H. McGlumphy, Van Ameringen-Haebler, Inc. (8) Paul C. Rich, Western Precipitation Corp., Los Angeles. (9) Left to right, Dr. L. W. Bass, formerly of Mellon Institute and now director of New England Industrial Research Institute; Walter Schmidt, general manager, Western Precipitation; Col. Albert H. Hooker, CWS; George M. Norman, Hercules Powder; Gaston F. Du Bois, vice-president, Monsanto.

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(1) M. Tishler, Merck & Co. (2) Left to right, M. C. Rogers, Lakeside Press; M. T. Carpenter, Standard Oil of Indiana; C. Sullivan, Barrett Co.; M. De Sima, Great Lakes Carbon. (3) Left to right, A. C. Elm, New Jersey Zinc Co.; Dr. Robert J. Moore, Bakelite Corp.; William M. Bauer, Pittsburgh Plate Glass Co. (4) Left to right, Dr. Paul K. Leatherman, director of research, Emerson Drug Co.; E. A. Turner, International Nickel Co. Inc.; and R. T. Barnes Jr., International Nickel. (5) Dr. and Mrs. Benjamin T. Brooks (well-known petroleum technologist). (6) Front, left to right, Dr. V. Molinari, Bakelite Corp.; John M. Coe, Bakelite Corp. Back row, left to right, Harry A. Hoffman, Bakelite Corp.; C. R. Cornthwaite, Quartermaster Corps, U.S.A.; Lt. E. T. McBride, Quartermaster Corps. (who presented 2 papers before the Paint, Varnish & Plastics Div.); Wm. H. Butler, Bakelite Corp.; L. C. Fleck, Kimberley-Clark Paper Co.; A. C. Eaton, Planter's Nut & Chocolate Co.; Robert J. Moore, Bakelite Corp. (7) Dr. Charles L. Parsons, secretary, ACS, and Dr. Gustav Egloff, director of research, Universal Oil Products Co., Chicago.

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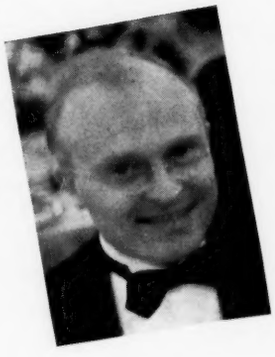

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. . . . and Still more

(1) Dr. H. N. Holmes, Oberlin College and president of the ACS, and Dr. Per K. Frolich, Esso Development Laboratories and president-elect of the society. (2) Dr. Elmer K. Bolton, Du Pont. (3) T. H. Vaughn, Michigan Alkali. (4) Dr. W. G. Young, head of chemistry department, U. C. L. A. (5) A. Emery, assistant secretary, ACS. (6) J. K. Roberts, Standard Oil of Indiana. (7) Prof. Hixson, Columbia University. (8) Capt. W. A. Bush, California Flaxseed. (9) William Newkirk, Corn Products Refining. (10) C. Morey, Commercial Solvents.

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If you were in our shoes, we believe you'd feel as we do, the extra responsibility imposed by the wide use of Columbia products in meeting war needs. Products such as we make are essential aids in producing rubber, steel, munitions, chemicals, textiles—virtually everything our armed forces use or wear. In our shoes, you'd keep production at peak levels—and maintain quality at the highest standards—and try to make the most efficient use of every available transportation facility.

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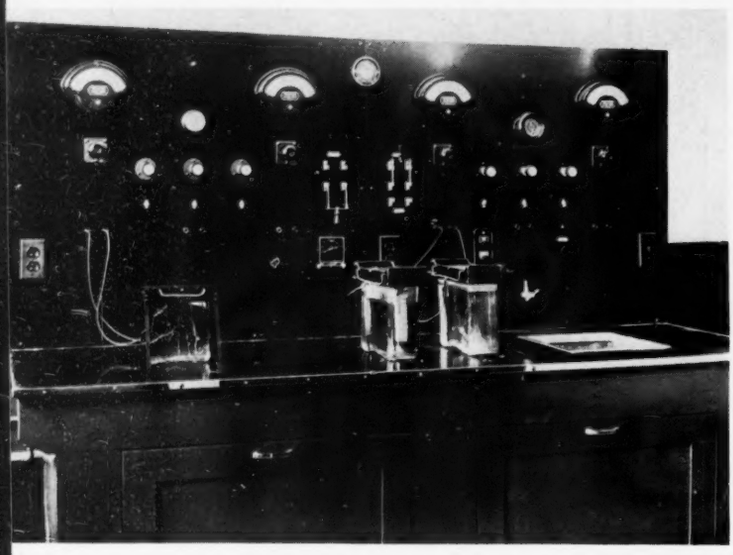

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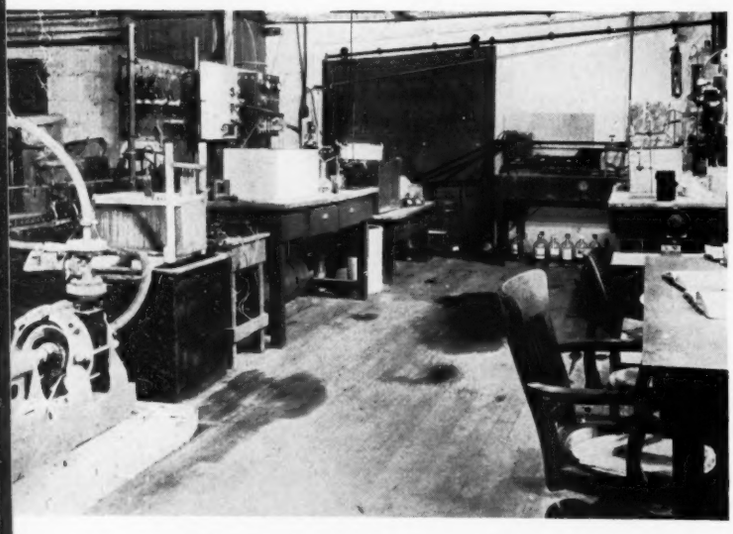
Above, electroplating control board for experimental electroplating tests, examinations of raw materials and supplies in electroplating processes. Below, research room in the Hanson-Van Winkle-Munning laboratories with new pumps, tanks, and heating facilities.



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Below, instrument rooms with optical bench, microscopes and photographic equipment.

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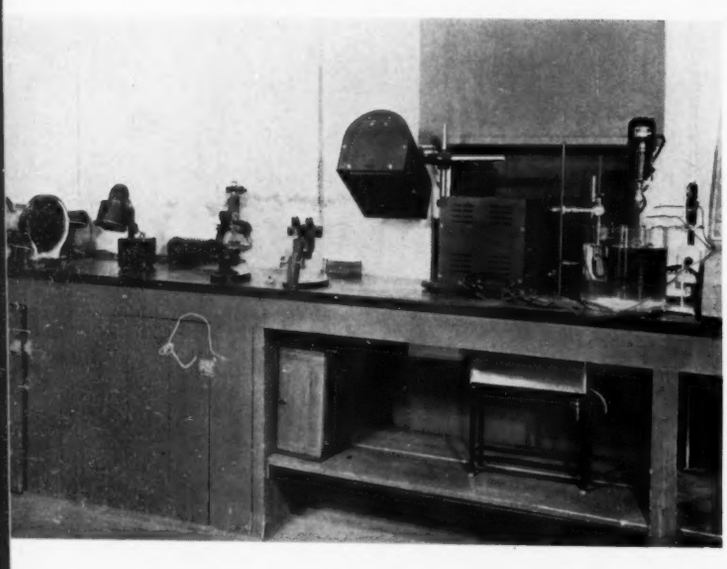

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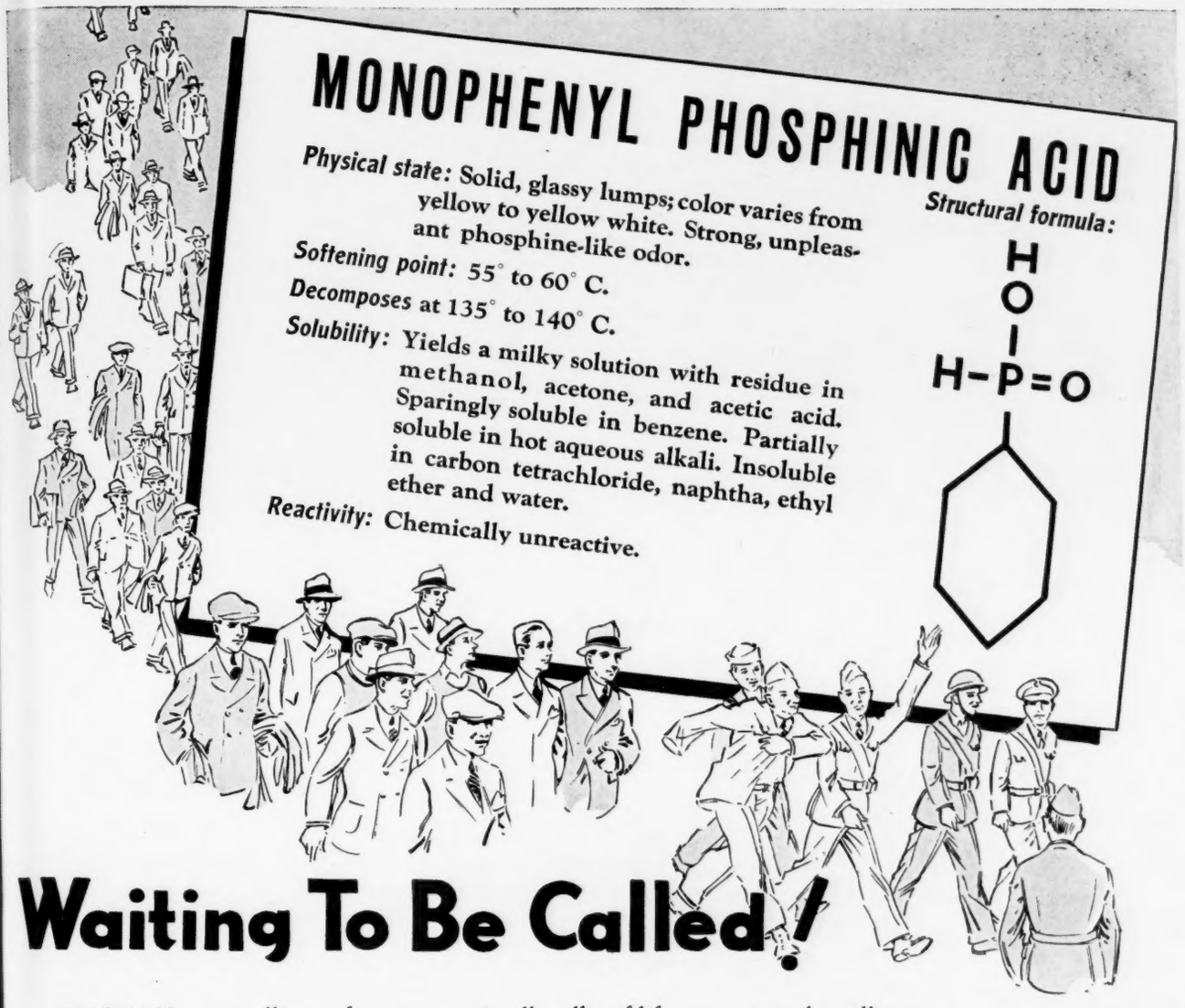
The Industry in Pictures

(1) Two movie starlets on a nationwide tour to sell War Bonds and Stamps stopped at Allis-Chalmers to look over machining operations on this propellor shaft being rushed to completion for a navy warship. (2) Plexiglas, fabricated by House of Plastics, Cleveland, is replacing aluminum in this knife-sheath which fastens to the belt of packing house workers. (3, 4, 5) Plating laboratories of Hanson-Van Winkle-Munning Co., Matawan, N. J., were recently completely reconditioned and expanded to provide facilities for increased volume of research and experimental work.

2


MONOPHENYL PHOSPHINIC ACID
Physical state: Solid, glassy lumps; color varies from yellow to yellow white. Strong, unpleasant phosphine-like odor.
Softening point: 55° to 60° C.
Decomposes at 135° to 140° C.
Solubility: Yields a milky solution with residue in methanol, acetone, and acetic acid. Sparingly soluble in benzene. Partially soluble in hot aqueous alkali. Insoluble in carbon tetrachloride, naphtha, ethyl ether and water.
Reactivity: Chemically unreactive.
Structural formula:
H
O
H-P=O

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Today . . . in the Victor Research Laboratory . . . scores of phosphorus compounds similarly await the call to service of industry.

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- Alkyl Ammonium Phosphates
- Fireproofing Compounds
- Calcium Phosphates
- Magnesium Phosphates
- Potassium Phosphates
- Sodium Phosphates
- Sodium Pyrophosphates
- Potassium Pyrophosphate
- Alkyl Acid Pyrophosphates
- Formic Acid
- Aluminum Formate
- Sodium Formate
- Sodium Boroformate
- Oxalic Acid
- Calcium Oxalate
- Sodium Oxalate
- Magnesium Sulphate
- Sodium Aluminum Sulphate
- Ferrophosphorus
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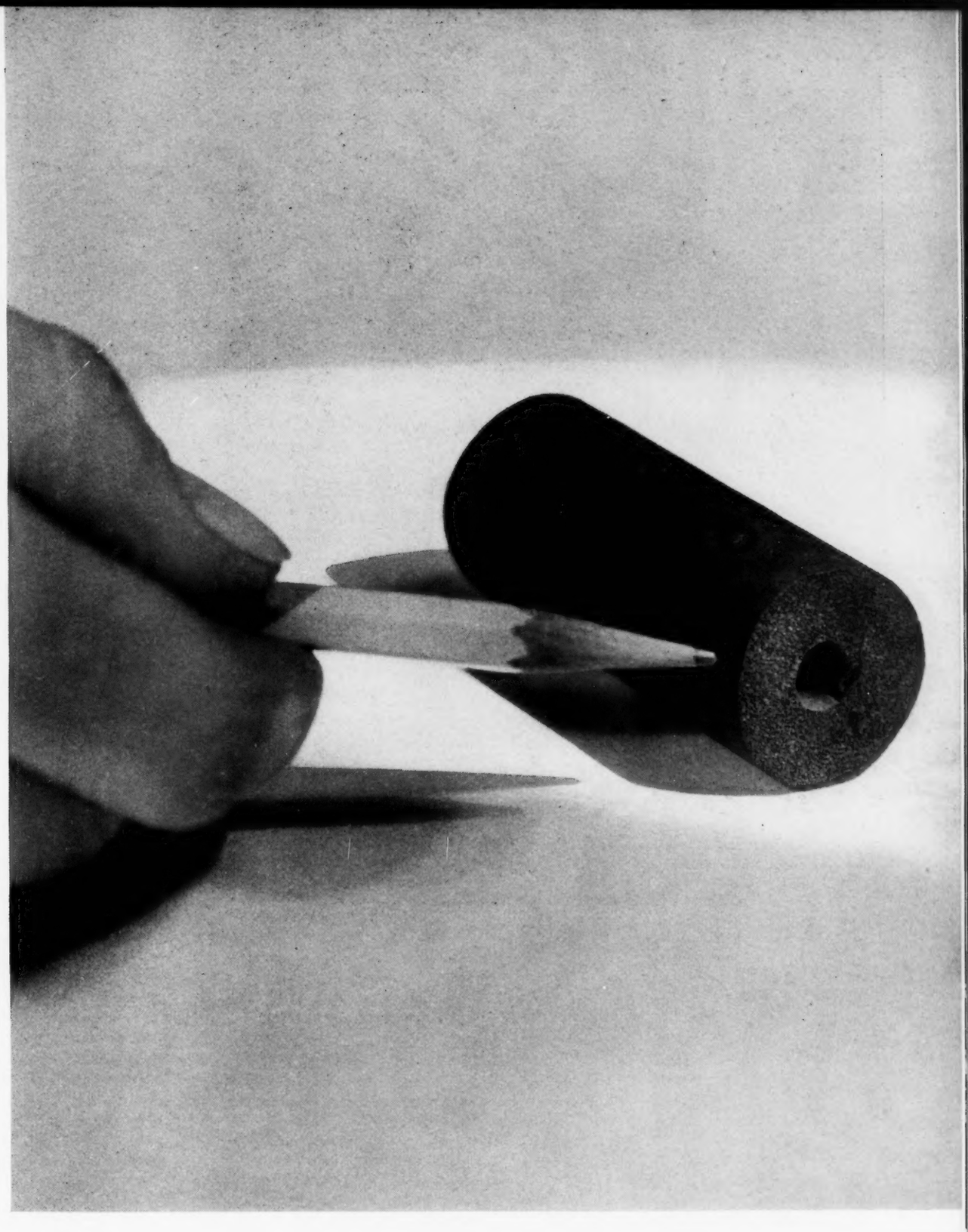


NEW CHEMICALS FOR INDUSTRY

B. F. Goodrich is now using 100% reclaimed rubber in blown sponge rubber products replacing natural crude formerly used. Blowing agents and methods are same, sodium bicarbonate being the agent. The new reclaim is made in molded shapes or in slabs.

Digest of Chemical Developments in Converting and Processing Fields

CHEMISTS AT WAR

A staff report of the 103d meeting of the American Chemical Society held at Memphis, Tenn., the week of April 18.

THE inevitable demands upon the chemical man-power of the nation in an all-out war program, together with the necessity of withholding information that might be of aid and comfort to the enemies of the United States materially reduced the number of chemists attending the 103d meeting of the American Chemical Society, held in Memphis during the week of April 18, and, likewise, forced a very noticeable decrease in papers presenting new and sensational discoveries in new products and manufacturing technique. With the country already faced with a serious shortage of capably trained chemists, chemical engineers and technologists it was to be expected that manufacturers would find it impossible to permit large numbers of professional men to take time out even for an American Chemical Society gathering. Under such circumstances a registration of some 2,300-odd was surprising.

Progress in studies of industrial alcohol, oil, sugar, plastics as substitutes, and public health were described at the Society's first meeting since the United States entered the war. With many of the chemists engaged in secret research for the government, the papers presented numbered but slightly more than 300, a decrease in comparison with previous meetings.

"The Chemist's Place in Civilian Defense" was discussed by Col. A. Gibson of the Chemical Warfare Service at the general meeting of the Society held Monday afternoon opening the convention. "Cotton Yesterday, Today, and Tomorrow" was the subject of an address by Dr. Henry G. Knight, Chief of the Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture. Indeed "King Cotton," very appropriately received considerable attention at the Memphis meeting. Its place in war was duly emphasized and several new uses described in detail.

Unfortunately the gifted orator, Mayor Walter Chandler of Memphis, could not be present at the opening session. He was in New York to receive a plaque from the National Safety Council honoring Memphis as the safest city in 1941. One wag standing with some two hundred arrivals Sunday evening at the station and unable to obtain instantaneous taxi service expressed the opinion that it was easy to see why Memphis was a "safe" place to be in. However, what little disgruntledness this excusable oversight caused was soon forgotten in the warmth of Memphis' famed southern hospitality.

Other highlights of the opening session included the presentation of two $1,000 awards by Dr. Harry N. Holmes of Oberlin College, president of the Society. The Eli Lilly and Company Award in Biological Chemistry was given to Dr. Earl Allison Evans, Jr., of the University of Chicago, and the Borden Company prize for outstanding research in the chemistry of milk went to Dr. George E. Holm, biochemist of the Bureau of Dairy Industry, U. S. Department of Agriculture, Washington, D. C.

Dr. Lawrence W. Bass, Assistant Director of the Mellon Institute, presented a progress report of the Society's Committee on Economic Status, of which he is chairman. Dr. Bass specifically requested that no details of this interim preliminary report be published until all of the material has been completely ana-

Scene at the American Chemical Society banquet, 103d meeting.

lyzed and prepared for release in its entirety.

Sixteen papers were scheduled by the Division of Industrial and Engineering Chemistry, which met on Tuesday and Wednesday. At a Tuesday morning session, Dr. R. F. Nickerson of the Mellon Institute spoke on "Structure, Properties, and Industrial Utilization of Cotton."

Although cotton already is a highly versatile raw material, the scarcity of other industrially important fibers such as jute, hemp, wool, and silk may require a considerable extension of cotton's utility. Textile products, ranging from miners' brattice cloth and an untold number of military and civilian necessities to ships' ropes, are playing a vital part in the war effort. Cotton substitutes for some of the imported fibers would greatly increase the domestic sufficiency of many industries and assure the continuation of production at an undiminished rate even when reserves are exhausted.

In many instances the direct substitution of cotton for some scarcer material can be made without sacrifice in quality or efficiency. There are however, other cases where a substitution of domestic cotton for some other fiber would not be so successful. That is, a particular fiber with its characteristic constitution, structure, physical properties and behavior in relation to its environment may often perform outstandingly well in some specific use.

For example, hemp resists sea water to a high degree and is, therefore, ideal for ships' ropes. Cotton is not now versatile enough to equal the performance of all the other fibers in their specialities. The situation seems to demand that, wherever possible, cotton be adapted or modified to give maximum performance.

Much information on the structure and properties of cotton exists but is not readily accessible. A summary of this knowledge was presented as a means of facilitating the modification of cotton for unusual uses. Briefly, a description of the probable structure of cotton and of its relationship to known properties might aid engineers faced with the problem of changing over to a new material. Dr. Nickerson's review detailed many of the effects of such factors as moisture, heat, stresses and time on cotton so that such efforts can be directed along likely lines.

Properties of Cotton

Cotton, like many other cellulosic materials, derives its properties and behavior from a combination of long slender molecules, more or less highly crystallized, and a high content of hydroxyl groups which result in considerable interaction between molecules. Cellulose molecules are not kinked as are wool and rubber molecules and, consequently, the cellulosic structure is not plastic or elastic. With a knowledge of the complex structure and its influence on properties, chemists and engineers may be able to tailor the natural product to their immediate needs.

Cottonseed meal, a product of high protein content obtained from cottonseed oil mills that has been used as a cattle feed exclusively so far, may find an industrial application in the manufacture of phenolic molding powders as a result of a research development by Dr. Fritz Rosenthal, University of Tennessee plastics technologist.

A molding compound, consisting of equal parts of phenolic resin, cottonseed hulls, and cottonseed meal, has been developed at the Cotton Oil Laboratory of the Tennessee Agricultural Experiment Station. The economic advantage of such a compound lies in the fact that its raw material cost is 20 per cent below that of a commercial phenolic molding powder.

The technical results obtained are in close agreement with those obtained with soybean plastics. Hence, it is proved, according to the author, that the cooking of cottonseed meal should not be an impediment for its incorporation in plastic molding powders. This is significant because the molding powder containing equal parts of phenolic resin, cottonseed hulls, and cottonseed meal consists of two-thirds, by weight, of cottonseed oil mill commodities.

Defends Standard of New Jersey

One of the outstanding events of the four-day session was a spirited defense of the Standard Oil Company of New

Jersey and its actions in the controversial subject of synthetic rubber by Dr. Benjamin T. Brooks, consulting chemist and internationally known petroleum technologist.

Said Dr. Brooks to a very receptive audience: "The record clearly shows that the government's synthetic rubber program has not been delayed a day by any question of company interest.

"In view of the sensational charges made in recent weeks by Thurman Arnold against the company which has been mainly responsible for the development of synthetic rubber manufacture in the United States, i.e. the Standard Oil Company of New Jersey, the facts which are of particular technical interest are worth noting," he added.

"It is possible that the manufacture of synthetic rubber from petroleum hydrocarbons is one of these major economic readjustments which will endure after the war. It would seem to be prudent to keep the synthetic rubber industry alive, by an import duty of about ten cents per pound, if necessary, so that we shall never again be the victims of a Stevenson plan to maintain excessively high prices for plantation rubber.

"Much of the misunderstanding of the role of the Standard Oil Company of New Jersey in this matter is due to the lack of knowledge of our international patent system and our obligation, up to December 1941, not to infringe foreign-owned patents, just as we expect foreign manufacturers to respect American-owned patent rights. Up to 1936, synthetic rubber for tires was still so unsatisfactory, in spite of years of research here and abroad, that both the I. G. in Germany and the Standard Oil Company of New Jersey here regarded a satisfactory result very doubtful. The German government then stepped in with financial support of the synthetic rubber work of the I. G. and insisted that their research be continued.

"I have indicated the many years of research behind synthetic rubber. The only practical synthetic rubber for tires, known up to now, is the Buna S rubber made of butadiene with styrene as a co-polymer, which was developed in Germany. If the Standard Oil Company of New Jersey or any other American company had not acquired the patent rights to manufacture this type of rubber in the United States, no American company could have undertaken to manufacture such rubber prior to December 1941, except as a willful infringer and subject to heavy penalties if convicted.

"Mr. Arnold seems to be conscious of this fact, for he has suggested that our government should carry on extensive research presumably so that we would be independent or in advance of foreign-owned processes in this and other matters. "Would such a program have been utilized prior to the Japanese capture of all Malaya? Would it have been considered injurious to the interests of our friends the British and Dutch rubber planters? Would such researches be lead-pencil researches, all on paper, or would the government have carried out the necessary large-scale cracking, catalytic dehydrogenation, purification and polymerization investigations, building fractionating towers 150 feet high, and if so would it not necessarily have to operate a complete oil refinery of considerable size?

"Should we do away with patents entirely? Should we refuse to recognize or grant patents to foreigners? If not, should American companies not acquire them? If we acquire these rights in the United States, should we leave the rest of the world to the foreign inventor? Mr. Arnold does not tell us. An American company can only accept our laws as they are and run the risk of being tried in the Supreme Court of Newspaper Headlines, without redress for libel or slander if the accusers happen to enjoy the immunity of government officers.

"As regards the record of the American companies in this matter, the record clearly shows that the government's synthetic rubber program has not been delayed a day by any question of company interest. Jesse Jones is reported in the press as having stated many weeks prior to Mr. Arnold's newspaper trial that 'the technical skill of many of the refining and rubber companies as well as their patents have been pooled to insure maximum efficiency and production.'

"On March 3, 1941, Frank Howard of the Standard Oil Company of New Jersey wrote W. L. Clayton of the Federal Loan Agency, 'Re the suggestion that we waive patent royalties and infringement claims in connection with synthetic rubber, we agree, in view of our interest and cooperation with national defense and government agencies.'

"On April 1, 1942, Mr. W. S. Farish, President of the Standard Oil Company of New Jersey, testified before the Truman Committee of the U. S. Senate that 'I have selected from scores of communications with the Government and Government suppliers the following documents which show clearly not only that Standard's technical information about synthetic rubber was given freely to the Army and Navy, but also the Government was urged to act promptly if there was any possibility that rubber supplies might be cut off in the event of war. This began eight months before even the European war started and nearly three years before Pearl Harbor.'

"Mr. Arnold withdrew his charge that Standard had frustrated the development of synthetic rubber in the United States. But who can blame the press for headlining a sensational accusation by the Assistant Attorney General of the United States?

"The fact has already been published that the production of plants now built, building or contracted for will be at the rate of about 100,000 tons per year by January 1943. Before the fall of Singapore, there may have been some difference of opinion as to the urgency of the synthetic rubber program.

"It is now realized by both government and private companies that the quantities which must be produced so as not to jeopardize our military effort make it a government responsibility. Building the necessary plants requires time, roughly half the time required to design and build a battleship. It is obvious, therefore, with the necessity of manufacturing synthetic rubber not only for our own military requirements, but also for our allies, that civilians will have to wait, perhaps until late 1944 or until the end of the war."

Touching on the more scientific aspects of petroleum research Dr. Brooks predicted increasing dependence of the industry on foreign sources such as Mexico, Venezuela and the fields of the Middle East during the next 30 years.

Pointing out that "we now produce and consume as much petroleum in one year as we did in the total of the first forty years of the industry, that is, up to 1900," Dr. Brooks declared that every important oil producing state in the United States except Texas has passed its peak of production, and asserted that price levels of petroleum may be high enough long before 1972 to make a shale oil industry profitable. Known resources of this material in the United States are enormous, he added.

The petroleum industry is the only industry possessing both the raw materials, the experience and the technical organization adequate for the large scale production of synthetic rubber, Dr. Brooks declared. "In the last war our sources of natural rubber were not threatened, nor did our armies and equipment move on rubber tires. Many chemists believed that rubber was one of those natural products which, like cane sugar, would probably always be produced more cheaply from natural sources than by synthetic methods."

Substitute Fuels

Civilians in the Axis controlled nations of Europe are harnessing everything from the steam in bakery ovens to the gas from garbage disposal plants to run their motor vehicles during the war, Dr. Gustav Egloff, Director of Research of the Universal Oil Products Company, Chicago, told the Society in an address before its Division of Petroleum Chemistry.

Development of substitute fuels has been brought about by the nationalistic desires of many groups, and has pointed the way for utilization of indigenous resources when the principal fuel is unavailable, Dr. Egloff declared. "A survey of substitute motor fuels particularly at this time is decidedly important in the economy of a world at war, and for the future may be indicative of the ability of nations lacking in petroleum resources to become self-sufficient," he added.

Although fuels such as compressed gases, alcohol, and shale have not been as important in military usage as liquid fuels, they are used exclusively by the civilian populations, along with wood-burning and coal-burning automobiles, trucks, buses and boats, said Dr. Egloff, reporting researches made in collaboration with P. M. Van Arsdell, also of Universal Oil Products Company Research Laboratories.

Substitute fuels and petroleum have made 122,700,000 barrels of fuel available to the Axis countries, Dr. Egloff said. "At the end of 1941 it was estimated that there were a total of 107,225 compressed gas vehicles which released approximately 2,553,000 barrels of liquid fuels, and a maximum of 373,143 producer gas vehicles in use in Europe, which saved about 7,780,000 barrels of oil fuel. Approximately 13,200,000 barrels of benzol and alcohol were produced on the European continent in the same period and 233,000 barrels of shale oil also had been produced. Sweden and Spain planned to produce greater quantities of shale oil from their undeveloped resources."

Until Axis control is established in some large oil producing country, the need for greater quantities of substitutes will be present since the Russian invasion has cost Germany about 21,500,000 barrels per month, of which at least 4,250,000 barrels must be used in maintaining communications and industry behind the battle lines, Dr. Egloff pointed out.

"During 1940 considerable progress was made in adapting the motors of Europe to the use of substitute fuels, and also in building plants for the manufacture of synthetic motor fuel. The quantity of petroleum and substitute fuels produced throughout Axis Europe amounted to a maximum estimate of 128,329,000 barrels, and consisted of gasoline from petroleum, coal and water gas; compressed gases; wood, alcohol, benzol, and shale oil.

"It is an evident fact that the Axis nations rely to a considerable extent upon substitute fuels. These substitutes include gasoline from hydrogenated coal and the Fischer-Tropsch plants, benzol, compressed gases from natural gas, coal, coal carbonization units, city gas plants, and sewage. Other substitutes in line of their importance are alcohols, wood, coal, coke, ammonia and acetylene.

"The quality of motor fuel manufactured directly by the eleven Fischer-Tropsch plants has an octane rating averaging about forty. There are means of reforming this gasoline to a high enough octane value to make it suitable as aviation gasoline. A further advantage of these plants lies in the fact that they may be operated efficiently on a much smaller scale than the direct coal hydrogenation plants operating on the older Bergius process. Due to the possibility of decentralization of these plants, there is less danger from bombing, and even if a direct hit is scored there is less loss of capacity. However, it should be noted that Japan has been obliged to stop the building of a number of Fischer-Tropsch plants because Germany can not deliver the steels necessary for their construction.

Considerable Benzol Production

"Germany has considerable benzol production amounting roughly to 4,300,000 barrels yearly. Present motor benzol production is used for fueling the airplanes.

"Germany had twenty-five synthetic fuel plants in 1940 and numerous others were said to be in construction. The steel shortage in Germany greatly reduces the output of hydrogenation products since the obsolescent and corroded high pressure, high temperature chambers can not be replaced with the most efficient type of steel alloys." Methane and city gas are probably more widely available than propane and butane. Natural gas fields, sewage disposal plants, and coal hydrogenation, coal carbonization and oil refineries provide a considerable source of methane.

"Probably the most outstanding development of a gas source has been the utilization of sludge gas from sewage disposal plants. In Sweden as well as in other countries there has been a development in this line. The sewage gas as it comes from the disposal plant is 64 per cent methane and 35 per cent carbon dioxide. The cylinders for the use of sewage gas are about 1.4 cubic feet capacity and two to four cylinders are necessary for each car. The installations are the same as for city gas and methane.

"In utilizing the gases the changes in the car involve a spark advance and a change in the carburetor. Many cars are arranged so that a change from benzene use to the gas may take place at the instrument board."

Lubricating Oils in War

Lubricating oils are now required which surpass any ever made before. Most oils are quite adequate when fresh but they sooner or later break down on the job giving less satisfactory operation. One of the most serious factors causing deterioration is the oxygen of the air. Lubricants in service tend to absorb oxygen and the resulting chemical process of oxidation gives corrosive acids, sticky sludge, and the like, which, if allowed to accumulate, are very harmful.

During normal times, these dangers are avoided with a wide margin of safety by frequently changing the oil at a convenient service station. In war time, the problem is more urgent since it may be impossible because of combat conditions to change oil at predetermined intervals in engines and turbines powering crucial military and naval equipment.

G. H. vonFuchs and H. Diamond of the Shell Oil Company in a paper delivered before the petroleum chemists indicated that the stability or resistance of an oil to oxidation, depends on its composition, particularly its components known as "aromatics," which are found to some extent in all natural oils.

Von Fuchs and Diamond find that an intermediate amount of aromatic material provides greatest stability. They explain that if the right amount of the right kind is left in a lubricant for internal-combustion engines and allowed to oxidize, the first products formed protect the rest of the oil.

Scene: the Mississippi river; background; Memphis, Tenn.

New Sources of Alcohol

Possible new sources of industrial alcohol, essential in the manufacture of smokeless powder and other munitions, are being opened up by researches reported.

Investigations by Prof. Friedrich F. Nord, head of the laboratory of enzyme research of Fordham University, may lead to the development of a new industry which will accelerate production of this vital material.

Data presented by a group of Iowa State College chemists indicate that the lowliest forms of life, the bread molds, may be drafted as important new agents in producing about 25,000,000 more gallons of industrial alcohol from 100,000,000 bushels of corn or wheat than is possible with present methods.

Another research report, submitted by chemists of the research and development department of Joseph E. Seagram and Sons, Inc., Louisville, Ky., says that "the apparent shortage of industrial alcohol for war production purposes may be fully compensated by the use of a rapid alcoholic fermentation process developed in the Seagram laboratories, and it would not be necessary to use new strategic materials for the construction of additional plants."

Dr. Nord said that his discovery has an added significance in that it affects the whole processes of sugar decomposition. He pointed out that sugar is an energy supplier and that by utilizing the C_5 chain—a compound of five carbon atoms present in non-fermentable sugars—a new source of energy could be obtained.

But the importance of the discovery lies in its possible relations to the production of industrial alcohol, Dr. Nord said. Last year the United States manufactured 125,000,000 gallons of alcohol and this figure will be doubled in 1942. It has been estimated that 600,000 pounds of gunpowder are needed each day to maintain an army of 1,200,000 men under wartime conditions. Each pound of powder requires half a pound, or slightly more than half a pint of alcohol, and to make a single sixteen-inch naval shell requires 140 gallons of 190-proof (95 per cent pure) alcohol.

H. R. Bilford, R. E. Scalf, W. H. Stark, and Paul J. Kolachov prepared the report on the rapid alcoholic fermentation process developed in the Seagram laboratories.

"While the new, rapid, continuous process of fermentation has been employed successfully on a laboratory scale, pilot plant operations must be performed before the process will be placed in actual commercial practice."

Thymol to Racemic Menthol

A discovery reported by Prof. Henry B. Hass and A. L. Barney of Purdue University seemingly assures the United States of abundant supplies of menthol, formerly imported from Japan.

Foreseeing the possibility of the international situation reaching its present status, the Brown and Williamson Tobacco Company and the Vick Chemical Company established a joint fellowship with the Purdue Research Foundation the purpose of which was to attack the problem of developing a satisfactory domestic source of menthol.

The reason for the success of the Purdue chemists, it was explained, is that they employed two relatively new American inventions, the Lecky-Ewell precision rectification column, two-year-old brain child of a Purdue graduate student, and the nickel catalyst of Murray Raney.

The process starts with the meta cresol of coal-tar which is converted to thymol by treatment with isopropyl chloride made from refinery gases. There is nothing new in this step since thymol has been made thus for some years.

The thymol is treated with hydrogen gas in the presence of Raney nickel catalyst to yield menthone and isomenthone. Isomenthone is an undesired impurity which is removed from the menthone by precision rectification and is then isomerized catalytically to menthone. The menthone is then reduced to a mixture of menthol and a little neomenthol.

Neomenthol is also an undesirable impurity, smelling like camphor. It also is removed by rectification and reconverted to menthone which is recycled through the process. Thus all of the by-products are ultimately forced to yield menthol.

The process is being developed to commercial-scale operation at Delawanna, New Jersey, by the chemists of Givaudan-Delawanna, Inc., and of the Purdue Research Foundation who are cooperating in this effort.

Nitroparaffins As Solvents in Coatings

A series of new solvents for use in airplane dopes and other special types of lacquers was described by H. L. Wampner of the Research Laboratories of Commercial Solvents.

These new solvents, known as Nitroparaffins or NP's, are made by nitrating propane, the domestic fuel commonly called "bottled gas." Unique in their power to dissolve a wide variety of cellulose esters, resins, waxes, gums, and other coating materials, they can be used in the many types of specialty coatings needed today.

Mr. Wampner disclosed the fact that the Nitroparaffins are powerful solvents for most types of synthetic rubber. The application of synthetic rubber solutions as cements and for coating cloth for waterproof garments, tents, tarpaulins and the like is of great importance today in view of the shortage of natural rubber and the rapidly increasing production of the rubber substitutes.

Mr. Wampner described in detail the use of these Nitroparaffins in lacquers based on the newer cellulose esters and on certain synthetic resins. These new coating materials are practically nonflammable and are, for this reason, especially suitable for coating fabrics. Their resistance to sunlight, moisture and chemicals is excellent, but their use has hitherto been restricted by a lack of good solvents. The "NP's" now make it possible to utilize these newer coating materials in making lacquers and thus improve the quality of the films that are deposited. The more widespread use of such specialty lacquers is promised by these new solvents.

The Nitroparaffins are also powerful solvents for the special resins used to line the inside of food and beverage cans. These resins, because of their extreme resistance to attack by the acids normally present in certain foods, should help relieve the tin shortage.

With the commercial introduction of the Nitroparaffins, less than two years ago, chemists were quick to grasp the significance of the development and not only to apply it to the solution of lacquer solvent problems but also to use these new compounds as a basis for synthesizing literally thousands of new and valuable chemicals.

Chloropicrin, for example, is a well-known poison gas which may be made from a Nitroparaffin. Used during the last World War, this gas has found a more humane application in sterilizing the soil in which pineapples and various vegetables are grown. Formerly made from picric acid which had important medicinal and explosive uses, it is now being produced from one of the Nitroparaffins thus releasing picric acid for more essential uses.

Waxy Maize Starch

The growing of a new variety of corn, waxy maize, to supply a cornstarch with properties similar to tapioca is made possible by research which has been conducted jointly by the Bureau of Plant Industry and the Iowa Agricultural Experiment Station.

The United States has for the last few years imported about 350 million pounds of tapioca. Most of this starch has been coming duty-free from the Netherlands Indies and has displaced cornstarch from about one-fourth of the total starch markets of this country by virtue of its lower price. The closing of the Pacific to commerce will return most of this market to ordinary cornstarch.

(*Continued on Page 672*)

NEW PRODUCTS AND PROCESSES

By James M. Crowe

Quantities of nitric acid, vital ingredient of high explosives, may be released for war use if a new process of treating stainless steel proves commercially successful. The process was described before a meeting of the Electrochemical Society at Nashville by Dr. Herbert H. Uhlig, of the General Electric Research Laboratory.

Stainless steel, which consists of 18 per cent chromium, 8 per cent nickel, and the balance iron, has many military as well as civilian applications. Both to improve its appearance and to give it greater resistance to corrosion which might cause a structure to fail, it is usually treated with nitric acid, to which a little hydrofluoric acid has been added. This gives it a silvery instead of a grayish color.

Dr. Uhlig explained that the metal surface consists of microscopic peaks and valleys, and the effect of the acid is to eat away the peaks, while only slightly affecting the valleys, making the surface smoother.

He announced that still another acid may be used. Hydrochloric acid, by itself, would produce a different effect, he said, for it attacks both peaks and valleys, and the appearance and corrosion resistance are not improved.

However, he found that by adding a chemical "inhibitor" to hydrochloric acid, the valleys are protected, and this produces on the stainless steel a surface equal to that treated with nitric acid.

Since nitric acid is used now in enormous amounts to add necessary nitrogen to cellulose and other compounds in the manufacture of high explosives for shells and aerial bombs, the hydrochloric acid treatment for stainless steel may help prevent any nitric acid shortage in the explosives industry, he suggested.

New Oil Products

National Oil Products Company has recently announced two new oils developed by its leather chemists.

Tanoyl 1269, a substitute for sperm oil is said to be superior to the natural sperm oil in many respects for the tanning industry.

The second product, called Tanoyl 1230R, is a substitute for cocoanut oil. It is said to have the identical non-oxidizing qualities required in fat liquoring white leather where any slight oxidation will cause a yellowing of the leather. It is claimed that the two new oils have already proved very successful replacements in the tanning industry.

Metal Cleaner

A new cleaner called Matawan AL for aluminum and magnesium has been developed by the Hanson-Van Winkle-Munning Co., manufacturers of electroplating equipment and supplies.

It is designed for cleaning aluminum and magnesium in either sheets or castings. Used at a concentration of 4 oz. per gallon at 160 degrees F., it does not produce any etch or weight loss on aluminum sheet or casting after two hours' immersion. Machined and polished magnesium shows no weight loss or etching in 15 minutes or more.

Matawan AL at 4 oz. per gallon and 160 degrees F., has cleaned a mixture of equal parts of kerosene and heavy oil water-break free in 20 seconds. In a number of tests on production castings, the time required was from ½ minutes to 4 minutes for thorough cleaning, depending upon the type of work and amount of shop grease present.

This cleaner used at 175 degrees F. will etch the work slightly and slowly; thus, as the temperature is increased, the cleaning rate is increased, but at the expense of etching. It is not to be used as an electric cleaner—it is strictly a soak cleaner. To avoid etching, the temperature must be limited to 160 degrees F. At 175 degrees F. or higher for faster cleaning, some etching will take place.

No-Drip Coating

An improved plastic cork coating that stops dripping from condensation or sweating pipes, walls, tanks, ceilings, etc., has been announced by the J. W. Mortell Co.

The new product called "No-Drip" is applied by spreading in a layer, a quarter inch thick, over any metal, concrete, brick, wood, galvanized or painted surface, etc. The coating can then be painted any desirable color.

New Waxes

Three new types of hydrocarbon wax, developed by Phosphate Division of Monsanto Chemical Company, have been made available. The new materials are supplements to Santowax regular, and two of them have unusually high melting points and stability to heat. The products are designated as Santowax M, O, and P.

Only preliminary investigation of uses for the new materials has been made but indications are that they have potential usefulness in improving the stability of candles and other formed wax articles, as lubricants in specialized high temperature service, in compounding polishes and waxes, and as plasticizers in coatings and finishes.

Santowax M is a micro-crystalline wax with a melting point between 181°F. and 194°F. Santowax O is an oily crystalline material with a melting point of less than 122°F. Santowax P is a nearly white crystalline material with a melting point in the neighborhood of 410°F.

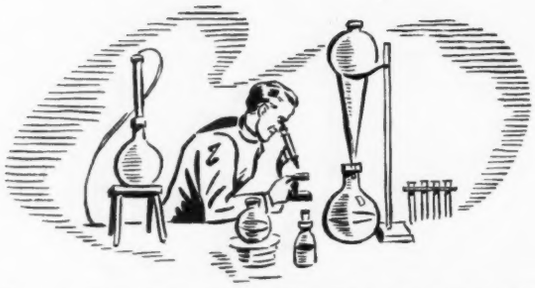
Metal Lead Primer as Paint Undercoating

As an alternative to aluminum paint priming, The Midland Paint & Varnish Company of Cleveland, Ohio, offer manufacturers affected a Metal Lead Primer which because of its metallic, non-rusting components is claimed to be equal in its protective value to that of a good grade of Aluminum Paint. The manufacturers claim Hyspar Metal Lead Primer is rust inhibiting, preventing rust from working from the inside of the material through the finishing coat. It may be brushed, sprayed or dipped, and dries hard in 4 to 5 hours. Since Hyspar Metal Lead Primer is neutral gray in color, it will not bleed through the finishing coat, or need more than the usual finishing coat required when aluminum was used. The manufacturer reports that this paint was originally prepared several years ago to meet the special problems of painted outdoor displays, and large neon spectaculars which being subject to all kinds of weather required a paint of protective ability with high elasticity as a feature. It is said that this paint will not crack nor flake off and holds tight to metal under rapid climatic changes and is also highly resistant to the salt impregnated air of the seaboards.

Shatter-Proof Coating

The interest in air raid precautions has brought a great many blackout and window-protective preparations on the market. Among these is a transparent, shatter-proof coating by the Wilbur & Williams Co.

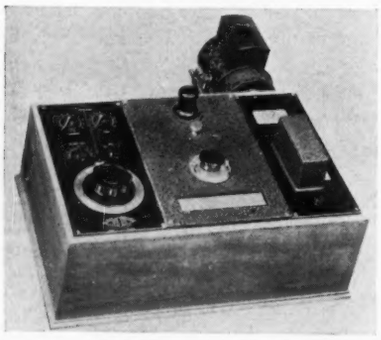
This new material comes in liquid form, ready for use. It can be applied by spraying or brushing. The coating is said to pass sunlight with very little absorption, and therefore the company claims weathers well without discoloration. It dries quickly to a film having a tensile strength of from 3,000 to 5,000 lbs. per sq. in. Elongation is over twenty per cent, permitting considerable movement of the glass without rupture of the film.



THE LABORATORY NOTEBOOK

Fluorophotometer

A new model fluorophotometer has been announced by Pfaltz & Bauer, Inc. The new instrument designated as Model "C," is said to be especially designed to accelerate routine control work in the determination of minerals and vitamins, maintaining established standards of accuracy.



The Model "C" is a complete self-contained unit, incorporating a simple electrical circuit, eliminating the use of amplifier and stabilizer. Features of the new model are a novel slide carriage, accommodating both the blank and sample to be tested and an automatic shutter which shields the sample from the light beam and cuts in the measuring circuit. Model "C" is said to have application in the fields of fluorometry, colorimetry and turbidimetry using wave lengths of narrow bands over the entire range of the spectrum from 3000 to 8000 A. It may be used either with absorption curvettes or test tubes.

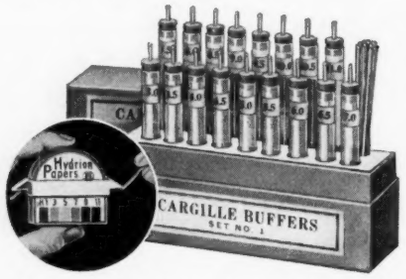
Safety Clothing

A new line of safety clothing has just been placed on the market by the Safety Clothing & Equipment Co. The new line is made up of Neoprene coated clothing and includes coats, pants, coveralls, welding jackets, aprons, sleeves, leggings and gloves. This clothing is said to provide protection against heat, sparks, splash, acids, chemicals, and oils—in fact, serves as general all-purpose protective clothing. Most items are available in light or heavy weight material. Folders describing the various items are available.

pH Set

A simple pH technique is available in a new Buffer Set No. 1 and Hydrion wide-range test paper, according to R. P. Cargille.

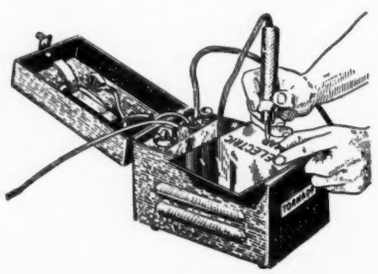
The set contains 17 buffer tablets which, when dissolved as directed, provide 17 solutions of known pH value. A vial fitted with applicator rod is furnished for each solution.



In making a test a drop of the sample is placed on the test paper and compared with the color chart furnished with the test paper. Then one of the known pH solutions close to the pH value indicated by the first test is selected and a drop placed on the test paper beside a drop of the sample. When differences in color are scarcely perceptible, a strip of test paper is dipped in the solution, drained and the pH judged to about 0.5 pH unit by color comparison.

Etching Tool

Breuer Electric Manufacturing Co. has announced additions to its line of electric etchers. They are made in various models for marking dies, tools and other portable equipment for easy, permanent identification. The outfit includes tools, switch, indicator lamp, cords, etc., in a compact, portable case.



INDUSTRY'S BOOKSHELF

The Electron Microscope by E. F. Burton and W. H. Kohl, Reinhold Publishing Corporation, New York, 233 pp., $3.85.

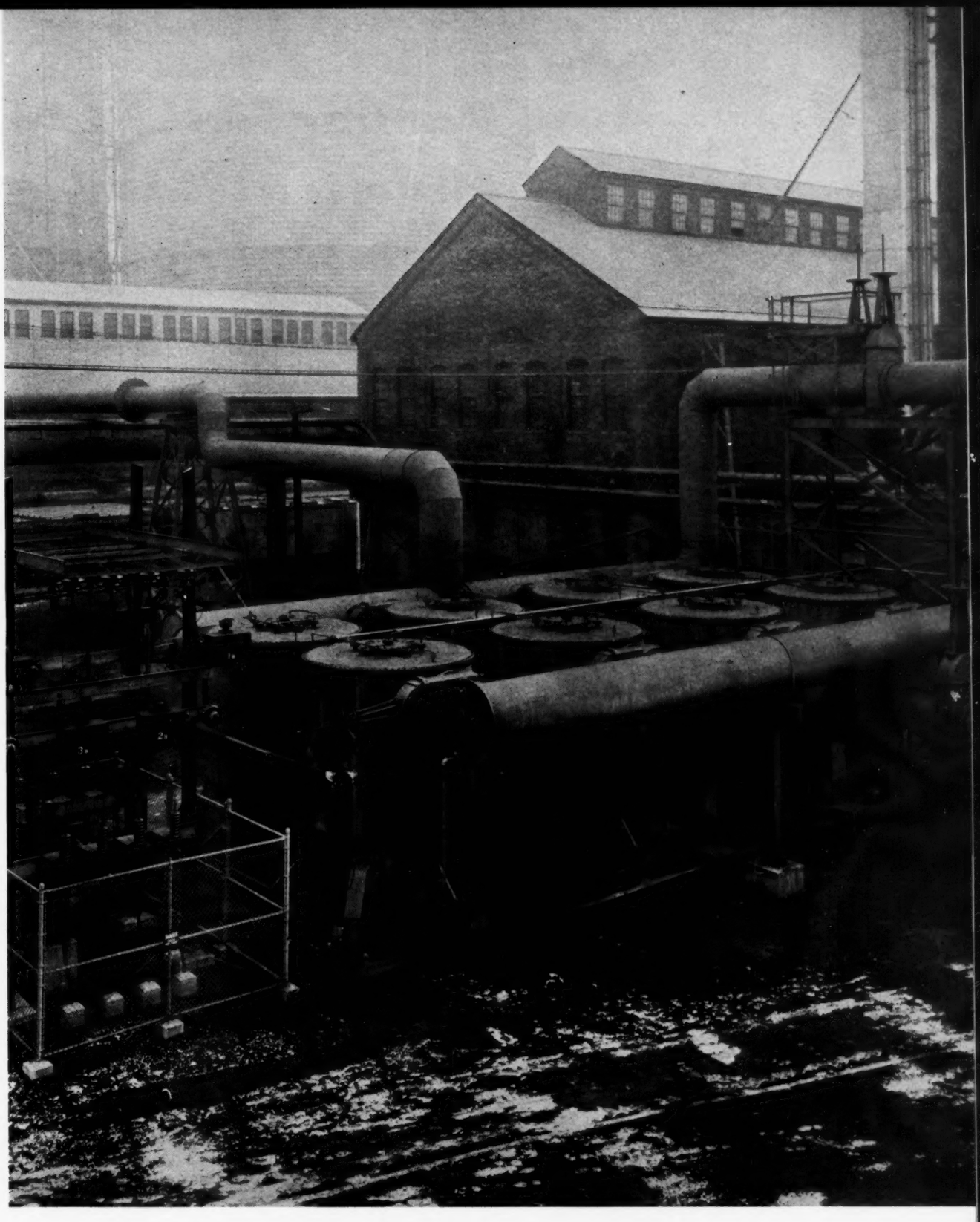
A powerful scientific tool, the electron microscope is rapidly spreading its influence through industrial and research laboratories. The great stride that was made in going from a magnification of about 2000 times with the light microscope to about 100,000 times with the electron microscope covered much ground which is now open for detailed exploration.

The authors of this book have been intimately connected with electron optics and the electron microscope right from the beginning. They have told this story well, leading up to the electron microscope through short, clear chapters on Vision, Light Microscopes, What is Light?, Wave Motion and Wave Motion Media, the Wave Theory of Light Accepted, the Electromagnetic Theory of Light, the Electron, the Dual Theory of Light, the Dual Theory of the Electron, the Motion of Electrons in Electrical Fields, and Electrostatic Electron Mirrors and Lenses. Throughout the book explanations are kept very simple with very little mathematics or involved technical terminology, and with many clear and elementary diagrammatic explanations. A goodly number of plates have been used to illustrate the applications to measurement of particles in dust, powders or smoke; photographs of emulsions; materials with large complex molecules or molecular aggregates; and biological and medical specimens. These present very convincing evidence of the fact that this new instrument has opened up a vast new horizon to man.

Acid-Base Catalysis by R. P. Bell, Oxford University Press, London, 212 pp., $3.50.

The phenomena of catalysis by acids and bases have long played an important part in the history of physical chemistry, particularly in the fields of reaction kinetics and the theory of electrolytes. The interpretation of these phenomena have undergone considerable change during the past twenty years. The idea of the present book is to assemble the different aspects of the subject into a picture suitable for students.

The first chapters describe laws governing catalysis in aqueous solution. Then follows a chapter on non-aqueous solutions, after which the book deals with molecular interpretation of catalytic reactions.



PLANT OPERATION AND MANAGEMENT

Modernization program of Boston Consolidated Gas Co. featured installation of this Koppers electric heater for removal of nitric oxide from gas distributed to Boston. Gas is largely coke oven gas but may contain 25% water gas in Winter. Gas passes between electrodes, NO oxidizes, gum forms which drops out.

Digest of New Methods and Equipment for Chemical Makers

Left to right, WPB speakers, Thursday session; J. E. Gates, Thomas J. Beirne, W. W. Fitzhugh, Dr. Julian H. Toulouse.

Left to right, WPB speakers; speaking, Col. Rankin, H. J. Howlett, and Douglas Kirk.

Left to right, Charles Southwick, J. W. Rankin, Talbot Minch and Charles L. Sheldon.

Packaging Chemicals and Chemical Specialties in Wartime

By Paul Slawter, ***Assistant Editor***

The American Management Association held its 12th annual Packaging Conference and Exposition last month and tuned it to the packaging problems created by the war. Here's a staff report of what happened at the conference and why. Maybe your problem is solved here.

THE changes being wrought by the war in the packaging field, the way in which American technological genius has met the packaging problems that the war has created and how these changes will permanently affect packaging developments were the underlying questions to which the American Management Association sought answers in its 12th Annual Conference and Exposition of Packaging, Packing and Shipping at the Hotel Astor, N. Y. City, April 14, 15, 16 and 17.

Conference sessions, which ran for the first three days of the annual event, were arranged to show how the typical American firm is meeting its everyday packaging problems. Unlike previous years, however, sessions were not confined to specialized interests but embraced all aspects of the packaging field—unit packaging, packing and shipping, and packaging machinery.

Most interesting to the chemical industry as a whole, by far, was the Thursday morning session—"What's Washington Thinking on Packaging?"—at which the entire staff of the Containers Branch of the War Production Board answered manufacturers' questions regarding critical packaging materials.

Among the new developments brought out by the questioning were a "passable" fibre package, with metal top and bottom, for use as a paint container and the fact that cotton fabrics are being substituted for burlap. Standardization of containers was stressed and manufacturers were urged to use larger containers and less sizes. There will be more glass containers replacing tin and less vacuum packing.

The experts who were questioned by H. J. Howlett, secretary of the AMA, included Douglas Kirk, Chief, Containers Branch; Charles Southwick, Fibre and Wood Container Section; J. W. Rankin, Priorities Specialist; Talbot Minch, Steel Barrels and Tight Cooperage Section; Charles L. Sheldon, Deputy Chief, Containers Branch; James E. Gates, Civilian Allocation Specialist; Thomas J. Beirne, Chief, Tin Can Section; W. W. Fitzhugh, Chief, Folding Cartons and Set-Up Box Section; Dr. Julian H. Toulouse, Chief, Glass Containers and Closures Section.

At the outset it was brought out by Mr. Southwick in answer to one question about outlook that the container shortage of last Fall should not be duplicated. He cited the forward buying on the part of some companies as one contributing factor to this shortage.

As for the outlook for raw materials of packaging, Mr. Gates had this to say: Steel, rubber and tin you cannot get with less than an Army or Navy rating. Aluminum is reflected in the recent changed order for collapsible tubes. Paper and glass future is not too certain. A marked shift to these materials will cause a shortage of glass. The glass industry operates at 70% of its capacity now and standardization of sizes could produce 30% more bottles with no additional machinery. (It was brought out later that additional machinery for this industry will not be sought.) Combined military and civilian demand, however, will be met only by eliminating some present users of glass and by the limitations which supplies of metal and rubber closures will enforce.

Charles H. Southwick predicted that there will be a shortage of wooden containers due to the huge export use, but generally speaking, supplies are seen as adequate after shifts are made.

Speakers particularly warned industrial users of packaging to take care before shifting to different types of containers. Dr. Toulouse, Chief of the Glass Containers and Closure Section, said that a switch to glass should not be made unless the product is essential and then only if the bottle would take little or no metal and rubber for closures and would require no additional buying of machinery or extensive conversion to handle. Redesigning of containers in simplifying them also should be avoided, he said, if it uses critical materials.

As to the immediate future of glass containers, Dr. Toulouse said that standardization would stress the use of less material. If the container is of an odd shape and is unnecessarily heavy it should

be omitted. He said that the country does not want new glass production facilities at this time. Concentrate on the design, he said, which can be produced in the greatest quantities.

Talbot Minch, in answer to a question about the percentage of steel drums used by industry gave this table:

Petroleum	57%
Chemical	18
Coatings	12
Food	7
Miscellaneous	6

He urged that whenever possible substitutes for steel containers be used.

In answer to a question "Is there anything promising in paint packaging now that tin cans are decreasingly available?" Thomas J. Beirne mentioned the newly developed fibre container with metal top and bottom and the use of glass containers. However, it was brought out that the use of glass containers brings up the need for metal and rubber for closures.

The following list of container materials in order of their availability was suggested in answer to a question:

1. Paper
2. Fibre board
3. Lumber
4. Glass
5. Cooperage
6. Cellophane
7. Plastics
8. Metal
9. Rubber

J. W. Rankin, Priorities Specialist, concluded the government session with a detailed explanation of the workings of PRP (Production Requirements Plan).

First session of the conference, "The Over-All Packaging Picture Today," was conducted by Oliver F. Benz, Development Division, Du Pont, and vice-president in charge of the AMA Packaging Division. This opening session was designed to give a broad picture of conditions in the three principal areas of packaging activity—Unit Packaging, Packaging Machinery and Shipping Containers.

Walter P. Paepcke, President, Container Corporation of America, Chicago, delivered the first address on "Containers." "The United States," he said, "is fortunately almost totally self-sufficient in the production of pulp which formerly was imported in very large quantities from the Scandinavian countries. The reclamation of waste paper, even at the present time, represents only perhaps one-third of the available supply.

"The paperboard industry has over many decades had a rather constant average annual growth of approximately 6%. In 1926 the total amount of paperboard produced was 3,350,000 tons. Fifteen years later, namely in 1941, total production amounted to 7,857,000 tons. Over a fifteen-year period, then, there was an increase of 4,500,000 tons or an average increase of about 300,000 tons a year. This would reflect a 9% average annual increase from 1926 to 1941, but then we must remember that 1941 represented an unusually active year which, incidentally, represented almost a 25% increase over the production of 1940.

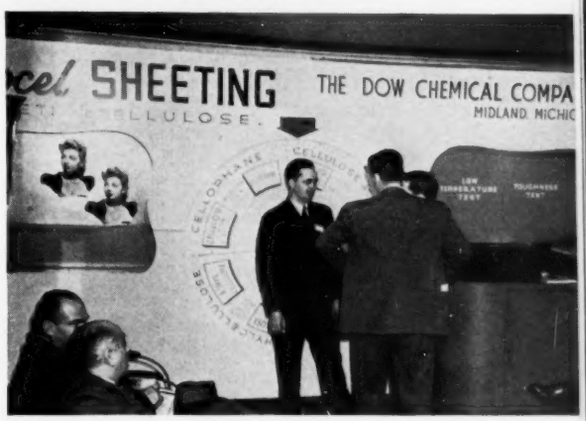
"To secure continuation of future supply of pulp wood, many factors in the pulp producing industry, my own company included, have been practicing reforestation, even to the point of giving away millions of seedlings to farmers, 4H clubs and others, all with a view to effecting a replenishment of supply to offset present use and consumption of growing trees.

"As far as waste paper is concerned, the paperboard industry, largely of the north, which depends upon waste paper as almost 90% of its raw material, has, as you know, done a very substantial amount of national advertising and promotional work to make the public more conscious of the need of saving paper so that it may be available in sufficient quantities to supply the present high rate of paperboard mill operations. At this point I think it might be fair to say that members of the Office of Price Administration have felt for many months that additional supplies of waste paper could be brought out at or below selling prices to adequately take care of the needs of the industry. Many of the members of the industry were mildly skeptical of this possibility. However, it has now been demonstrated to almost everyone's satisfaction that a more adequately informed and aroused public could and would cooperate to bring out the necessary amount of raw material of waste paper nature. Much credit is due the members of OPA who steadfastly stood their ground and with rather unshaken confidence held to their position. Waste paper has come out in ever-increasing amounts over the last few months, and today at least the fear of a dangerous and production-restrictive shortage has been dissipated.

"Now as to the mechanical capacity of the paperboard industry itself, it has thus far been sufficient to take care of the needs of the fabricating container industries. At some periods during the fall of 1941 deliveries were somewhat delayed, and in a relatively few instances package users were a little short of what they felt they required.

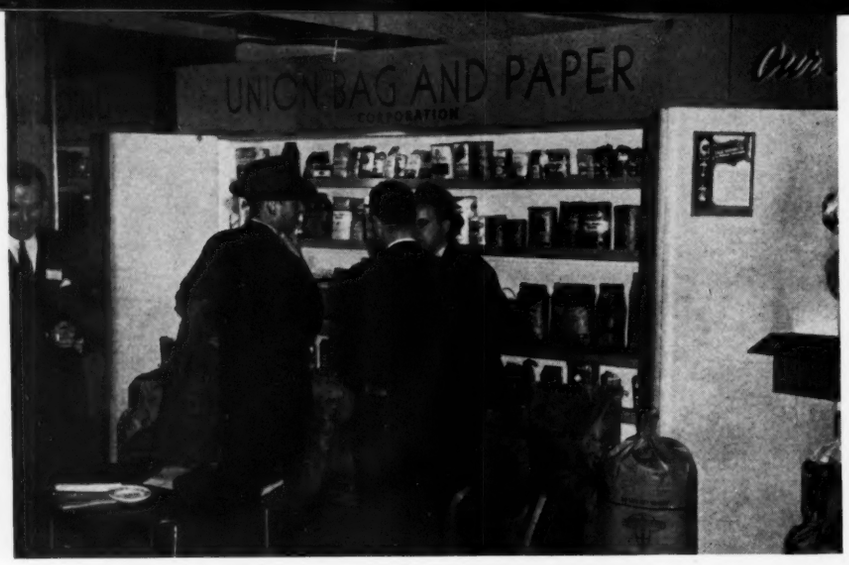
"Unquestionably there will be a further trend toward increasing the war demands for packages and perhaps a similar decrease in civilian demands. Almost every day we hear of further curtailments of production of various civilian commodities, and almost every day we similarly hear of manufacturers of formerly well-known civilian products taking on large and sometimes almost totally unrelated war contracts. It should also be remembered that many types of other than paper containers have found restrictions in their output because of priorities. Paper container manufacturers are constantly being asked to suggest substitute paper packages to manufacturers who are having difficulty in obtaining an adequate supply of tin, glass, wood, burlap or what not. The possibilities for important and effective research development and sales promotion work are very large indeed. Demands come up every day which involve invention, ingenuity, resourcefulness and whose satisfaction provides important solutions for further civilian packaging problems. We all know that the development of the tractor in the last war proved to be the beginning of the peacetime tractor for agriculture and other uses.

Dow Chemical displayed its ethyl transparent cellulose sheeting.



Du Pont displayed its new cellophane containers for substitute work.

Hinde & Dauch showed shipping boxes designed to transport war materials.



Union Bag & Paper showed a complete line of paper packages including shipping container units.

"The paper packaging industry today is supplying a tremendous amount of paper products for the Quartermaster Corps, Ordnance Department, Navy Supply, Lend-Lease and Chemical Warfare Service. It was no doubt surprising to many that no matter how well our offense and defense weapons are being produced they invariably require a concomitant production of protective packaging. Paper packages are being made for all types of cartridge cases, shells, Bandolier Clip cartridges, bomb fuses, incendiary bombs, Howitzer shells, shot, land mines, skiis, gas mask tins, tools, tank parts, Signal Corps equipment, submarine batteries, socks, jerseys, shoes, caps, aviator goggles, radiator compounds, etc. Then comes the tremendous amount of packaging required for the food for all the soldiers and sailors in our own and Allied armies and navies.

"The fundamental economics of packaging have often been questioned or misunderstood. There are some who believe that we may be going back to the cracker barrel and bulk package era. This seems inconceivable to me as our entire speed and momentum in merchandising depends upon prepackaging. Similarly, prepackaging, as we all know, is a much-needed and rather broadly accepted precaution against pilfering, lack of hygiene; admits of branding, assures constant and similar quality to the user at each repeated use, and permits of much more economical storing, warehousing, piling and transporting.

"I am happy to announce in this connection that just recently the Wharton School of Finance and Commerce at the University of Pennsylvania has undertaken at the request of my company a factual, scientific and scholarly study of the entire subject of the economics of packaging. Whether, in other words, prepackaging is fundamentally sound from an economic point of view; whether it has been overdone in some instances; whether in other instances it is subject to further and greater development."

Unit packaging was the second topic of the session and was covered by Joel Y. Lund, vice-president, Lambert Pharmacal Co., St. Louis, and president, Packaging Institute. Mr. Lund warned industry that the issuance of samples may lead to restrictive measures since they focus attention upon the industry involved. He told how an official of the Tin & Lead Division of the WPB heard a radio announcer offering a premium tube of shaving cream. His division at the time was trying to conserve the metals used in these containers so he called a meeting and the result was the restriction on tube containers.

"It is possible," he said, "that in the next 60 to 90 days that everything that can be used for packaging will be restricted."

Mr. Lund made reference to the Production Requirements Plan which will be in effect by July 1 and cited the fact that the form for materials which you must fill out makes the operations and inventories of your company an open book. "Standardize," was his message to the representatives of industry present. "Cut down the sizes of your containers and simplify their shapes."

As for the future, Mr. Lund was not very optimistic for companies whose products are not needed for the war effort. The collapsible tube order was just a starter. Plastic materials for caps are practically out. During the war, he said, packages must be functional and labels must use less color.

After the war, said the Packaging Institute president, packaging will be as different as the automobile will be. He said we must start afresh in an entirely new direction. "The old ways are not coming back."

Third speaker of the session was H. H. Leonard, president of the Packaging Machinery Corp., Buffalo. Not many weeks ago the government put the packaging machinery industry "on ice" for the duration. It was ordered to go immediately into all-out war production. The problem before the user of packaging machinery was to maintain his existing installations as best he could. Mr. Leonard suggested how to go about this problem and also issued his ideas for a program of maintenance and adaption and the packaging machinery industry's plan for servicing equipment.

At the Tuesday afternoon session, "War-time Packaging—the Forward Viewpoint," Alvin E. Dodd, president of the AMA, was chairman. First speaker was Irvin D. Wolf, vice-president of Kaufman Department Stores, Inc., Pittsburgh, who discussed the rôle of the package designer in making packages simpler and more useful.

Meeting was then turned over to D. S. Hopping, director of sales, Packaging Division, Celanese Celluloid Corp., for case stories in "Conservation and Salvage." Unquestionably one of the most promising approaches to the materials situation is conservation, Mr. Hopping pointed out, and his session was devoted to the stories of how many companies already have found it possible to meet critical material shortages through carefully planned programs of conservation, reclamation and salvage.

First speaker at this session was W. B. Keefe, Packaging Engineer for Westinghouse at Mansfield, Ohio. "Our problem," said Mr. Keefe, "has been to improve and simplify the wooden parts of our container designs and, more recently, to find the most economical and serviceable panel materials."

"Let us now describe briefly the design of our present crates. The crate is constructed with a three-corner lock construction at the top for security in handling. The front and back panels of the

Eastman Kodak displayed equipment for scoring, creasing, drawing and beading Eastman acetate sheeting.

crate are flush at the bottom. Thus the front or back panel of the crates can be removed without the necessity of laying them "back down" for opening. The wood cleats of the crate vary according to the size of the container, and for a refrigerator are somewhat different than for a range. However, taking a specific case for illustrating, the refrigerator crate, the major wood parts of the container are made from the standard 25/32" thick by 13/32" wide cleat. This cleat is also known as a vertical grain cleat, which assures more strength than could be obtained from flat grain.

"Each panel is of five cleat construction, four cleats framing the panel with one cleat through the center.

"Formerly, the cleating arrangement consisted of six cleats on each panel, made of 25/32" by 1¾" material. This new arrangement represents a considerable savings in the board footage required for the crates, and also a reduction in their weight. In the present refrigerator crate, there is 15½ board feet of lumber and 65½ square feet of corrugated material.

"The panel stock is of two Kraft liners .023 thick with .009 straw corrugated medium. This panel is B-flute construction. We had two good reasons for making a change to this new style crate. First, there was reduction in weight of approximately ten pounds per crate by this step alone, which reflects a savings in freight charges. Second, we made a savings in the cost of the material.

"The construction of this new crate has been the result of many laboratory tests, test shipments, and actual production requirements.

"This crate shows 96% of the strength of the former standard crate. It weighs 40 pounds, which is a 20% reduction in weight.

"Westinghouse has been using this new design of container for two and one-half months. Its performance in shipment have been satisfactory, verifying the results of our laboratory tests."

Dr. E. C. Merrill, Assistant Vice-President in charge of Research, United Drug Co., Boston, presented the next case history which is of especial interest to the chemical and allied products industry.

Owens-Illinois was on hand with standardized glass containers, tin products and insulux glass blocks.

"In the field of collapsible tubes, some three years ago, Dr. Merrill said, inside-coated aluminum tubes were subjected to tests by several companies interested in determining their suitability for numerous types and classes of products including tooth paste, shaving cream, ointments, etc. As a result of such research, in close cooperation with the aluminum tube manufacturers, there were developed numerous classes of inside protective coatings that proved their suitability and practicability in the general protection of the various classes of products under test. Our Company was successful in finding protective coatings in aluminum tubes for an entire line of some sixty different items.

"As the European War developed, however, aluminum became the most important metal in demand and the use of coated aluminum tubes was suspended. Nevertheless, the data obtained from the study and testing of numerous protective coatings has served, to a large degree, to assist consumers of collapsible tubes, now under limiting orders, to supply the principles of inside-coating protection in the case of tubes fabricated from lead-tin alloy, from tin-coated lead or silver-lead alloy with a tin content less than one and one-half per cent.

"And so, we have seen a progressive effort to conserve tin which is proving successful—so much so—that we doubt if tin will ever find its way back into the packaging of numerous classes of these products in which it has, hitherto, been used almost exclusively. It is also conceivable that a plastic tube with its proper inside coating may result from the evolution that is taking place in this field.

"Similarly, in the field of tin cans—conservation of tin is ordered in numerous classes of dry products and the elimination of tin plate in this field, has been successfully demonstrated in a great number of cases by the use of lacquered black metal where suitable coatings were, of course, provided for resistance against action by the particular product in question.

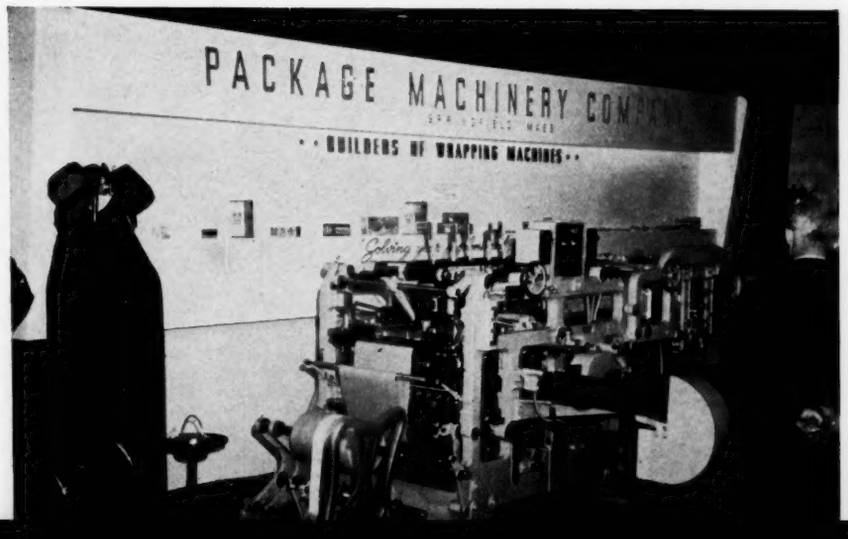
"Today, unfortunately, black metal becomes restricted due to a heavy demand yet, again, there has been gained accumulative information on the protective qualities of numerous lacquers and enamels, which becomes increasingly valuable.

"As an alternate container suitable for numerous dry products, including botanical drugs and psyllium seed, Mr. Harold Coleman, Chief of our Packaging Division, has found a highly protective, moisture-resistant container in the well known wax-lined cylindrical paper, ice cream-type container, which lends itself well to side and top labeling and in such dress loses its original package identification almost completely.

"According to statistical information, some 72% of paper is either thrown away or destroyed after initial use. In line with recommendations of the Packaging Institute—looking to the conservation of paper in packaged products—numerous economies in this direction have been accomplished by our Company in special reference to elimination of numerous bottle cartons, and use of glassine wrappers as a protection to the products. The reduction of gauge on board and numerous other steps have gone a long way in accomplishing a voluntary reduction in the use of paper. Curtailment of display and advertising material has also helped in this conservation program.

"In our pharmaceutical line, the use of varnished labels and glassine wrappers has been developed with the elimination of the

Packaging Machinery Corp. showed this package wrapping machine with new end labeling device.



outside carton—protection of the closure accomplished with a wrap-around shrinkable band.

"In order to save cobalt use in the coloring of blue bottles it is expected that the reduction in quantity used will result in a somewhat lighter blue container—yet it is expected that the standard blue, as called for in the special use for bottles for poison products, will be maintained due to their limited use.

"With the most recent orders on limitation of metal in closures, double shell and brass caps are eliminated and being replaced by lacquered black metal and plastic caps and in the cosmetic field especially, turned wooden caps on liquid products are finding a new field of application.

"Curtailment of aluminum, tin and lead for liners has resulted largely in adoption of impregnated paper materials for replacement."

Three topics were discussed at the Wednesday morning conference session. Roger Wolcott, executive secretary, National Consumer-Retailer Council, Inc., spoke on "Informative Labeling under Conditions of Price Control and Material Shortage." "The Packaging of Dehydrated Foods," was discussed by L. K. Harper, vice-president Sardik Food Products Corp. Leonard R. Steidel, manager, J. H. Hamlen & Son, concluded the session with his topic "Wooden Barrels Go To War."

Wednesday afternoon was devoted to case stories in "Standardization and Simplification" under the chairmanship of W. E. Braithwaite, Division of Simplified Practice, National Bureau of Standards.

Second speaker at this session, Charles B. Castle, assistant vice-president, National Sugar Refining Co., had a topic of interest to all—sugar.

"On December 13," he said, "the Office of Production Management put out order M-55 on sugar, which restricted both wholesalers and industrial users to a monthly percentage of 1940 but was subsequently changed to a monthly percentage of use or resale during the corresponding month of 1941. This seemed to intensify the consumer rush and for a time wholesalers handled nothing but 100-lb. bulk bags, the retailers having to weigh it out at the point and time of sale. Even then the consumer demand continued and then the wholesaler found 100 lbs. in some cases was too much to sell a retailer, hence the demand upon us for a 1-lb. and 2-lb. carton which represented a shipping weight of 24 lbs. and 50 lbs. respectively.

"This presented us with a problem. We obviously did not have production facilities to turn out all our consumer packages in one and two-pound units and since most retailers would sell nothing larger than a two-pound unit, the use of a five-pound, ten-pound and twenty-five-pound consumer package disappeared virtually over night. Inventories of the latter size packages that were probably only 60 or 90 days supply at a normal rate now appear to last indefinitely.

"At present our one and two-pound packaging unit are working at capacity and since the Office of Price Administration issued various Bulletins regarding the imminence of a ration card system, the consumer demand has diminished.

"Necessarily our plans and operations insofar as consumer packages are concerned will depend on several factors. First, and most important, is the allowable per capita ration per week and secondly, the period of time in which a ration stamp must be used. If a ration stamp is good for 8 ozs. of sugar per person and is good for one week conceivably very few, if any, refinery packages will be used at all. If, on the other hand, the ration is 12 ozs. per week and the ration stamp will be good for a thirty-day period conceivably we will have a demand to some degree for a consumer unit probably as large as a 5-lb. unit. To what extent this will follow, will depend on Mrs. Consumer and the length of time it will take her to adjust her program to the rationing system."

Case stories in "The Use of Substitute Materials," which wound up the conference on Thursday afternoon included information on the experiences of such companies as Quality Bakers of America, National Carbon Co., Inc., Defender Photo Supply Co. and Lit Brothers of Philadelphia.

The story presented by Alden H. Livingston, assistant advertising manager of Defender Photo Supply Co., Rochester, is interesting.

"The Defender company," he said, "is primarily a supplier of raw materials to the photographic industry. That is, we supply sensitized paper, cut sheet films and chemicals to commercial, professional, industrial, illustrative and amateur photographers.

"Photographic film is a perishable product. From its inception approximately 25 years ago, it has been foil wrapped. Many attempts have been made to use a substitute material on cut sheet film and until now none has been found quite as satisfactory as foil.

"Cut sheet films must be protected from light—it must be kept free of moisture vapor—it cannot be exposed to excessive heat. The wrapping material used must not affect the film in any physical manner. The reflective characteristics of foil against the radiation of light and heat made it difficult to find a substitute of equal qualities.

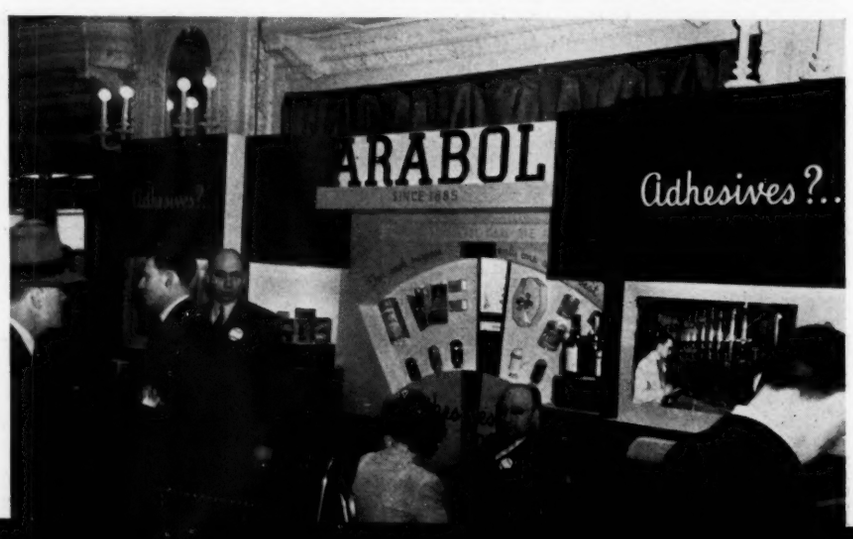
"After many tests, we settled on a double coated wet wax paper. This so far appears to be the most practical all-around substitute for foil for our use. It has an index of 2.4. It is photographically inert and just as good as foil in this respect. The opacity is obtained with the red dye which eliminates the blue and green light passing red only. The red is used for appearance and for psychological reasons; the latter because most darkrooms are red lighted. It is also commercially available a fact not to be overlooked. Eventually a black paper would be the solution but is not available at present due to down time on machines at the mill and time in mill operation is pretty precious these days.

"The sheet is coated on both sides with wet penetration wax, not greasy, which makes it a 45-pound sheet. Without the wax it is approximately a 35-pound sheet. It has a caliper of .0033 and is exceptionally free of pinholes which is more than we can say for 4 per cent. composition lead foil. The bursting strength is 39 pounds per square inch against 30 for foil.

"Although we were unable to meet the reflective characteristics of foil in the substitute, we found through heat absorption tests that the foil reflects heat up to a certain temperature and beyond that it absorbs and holds the heat. The substitute does not reflect heat but it does have the advantage that it does not hold the heat. As the temperature rises, the heat of the product wrapped in the substitute lagged behind several degrees. As soon as the heat was reduced, the temperature of the product lowered immediately.

"We were able to cut costs on this new wrapping material by about 50 per cent. because of the decrease in weight over lead foil. We are confident that the accepted substitute will meet the present emergency satisfactorily as a stop gap although we still look for something better."

Arabol Manufacturing Co. displayed adhesives and samples of packages.



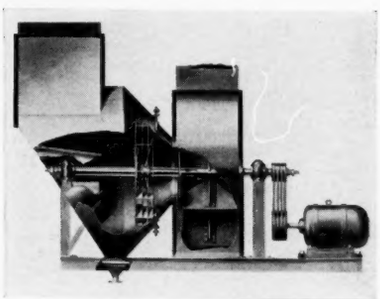
NEW EQUIPMENT

Dust Collector QC 175

The Claude B. Schneible Co. has designed a new collector unit to remove dust and fly ash from flues, kilns and furnaces, smelter stacks and cupolas. The operation does much for the appearance, health and comfort of the community adjacent to foundry, factory, smelter or mill. Practically all processing industries have this dust elimination problem.

The FiltreFan collector, as it is called, consists of a combination housing on which is mounted a rejector wheel and fan wheel. These two wheels are on a single motor-driven shaft. Solids are removed from the gas stream by means of this rejector wheel which throws the particles into a dead zone and hopper by centrifugal force. The dust particles do not come into contact with the wheel, thus eliminating wear on the wheel blades.

Dust-laden air or gas enters the scroll of the rejector wheel through a tangential inlet. It is caused to rotate by vanes, throwing the dust particles outward against the scroll from which they travel to the discharging hopper. The cleaned air enters the periphery of the rejector wheel and is drawn toward the center between the side sheets and the vanes. Through an outlet port in the center the air is drawn by a conventional fan wheel to be exhausted through an outlet duct.



Wheels, housings and hopper are built of heavy steel plate. The combination housing is mounted on a single base which includes the motor mounting. The housing is split horizontally in line with the shaft to make the rotating assembly removable. This assembly is dynamically balanced at the factory. Anti-friction bearings and large shafting prevent distortion of moving parts. Operated at comparatively low speeds, abrasive wear in the unit is negligible.

For high temperature stack gas, the FiltreFan is equipped with a hollow water-cooled shaft with packing glands and water connections provided at both ends.

Knapsack Filter QC 176

The Sparkler Manufacturing Co. has designed a "Knapsack Water Filter" for use wherever water pressure is not available, as in the case of army troops, construction gangs, summer camps, and so forth. It is provided with a small hand pump that can be used for pumping the water through the filter, and this hand pump also can be used for a hand-operated transfer pump.

The filter has a replaceable filter element, or cartridge, that weighs about 1½ pounds and is loaded with a special activated carbon compound. This filter cartridge is so inexpensive that it can be replaced with a new cartridge when it is spent. This cartridge will remove sediment, color, odor, and chlorine from drinking water. The capacity of the filter is about two gallons per minute and a cartridge will filter a total of from 100 to 500 gallons of water depending on the condition of the water.

The weight of the complete filter, including the pump and two rings of hose, is 19½ pounds. The filter has a suction lift of about 18 pounds. The over-all dimensions are 10 inches by 16 inches long, and it can be carried in a knapsack on the back or in a hand-grip.

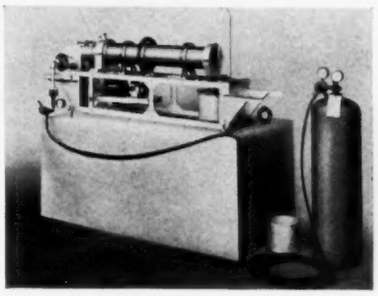
If it becomes necessary to take water from an open stream or well, the water can either first be treated with chlorine and then filtered through the filter or it can be filtered first and then sterilized with a small amount of chlorine. Although the filter will remove organisms and bacteria from the drinking water, as a matter of safety the water should always be sterilized in addition to filtering where there is danger of water-borne bacteria.

Experimental Dryer QC 177

The C. O. Bartlett & Snow Company has recently introduced a small sized rotary dryer which is being used for experimental and research work in laboratories, and for student instruction in technical schools and colleges.

This unit has a cylinder 6″ in diameter by 36″ long, fitted with internal feed and lifting flights. The cylinder is carried on a pair of steel riding rings supported on trunnion rolls and is rotated with a girt gear and sprocket drive. Different size driving sprockets permit four variations of rotating speeds from 2.06 to 4.92 R. P. M. The cylinder ends have machined seal rings, which engage split breechings. The feed breeching is equipped with a feed chute. The discharge breeching has a hoppered bottom and discharge chute arranged to connect to a covered receptacle.

The heat for drying is supplied by burning any of the standard "bottle gases" marketed under the names "Pyrofax," "Philgas," etc. Air temperatures range from 110°F to 800°F. Air volumes may be regulated from 0 up to about 100 C. F. M. The heating unit complete with gas burner, fan and motor is easily transferred from one end of the dryer cylinder to the other, permitting the dryer to be used in either parallel or counterflow operation.



The whole apparatus is mounted on a self-contained steel base, and is easily set for any slope to the horizontal by simply turning jack screws. The standard equipment, besides the dryer, includes a level for determining slopes, a ¼ H. P. 100 volt single phase 60 cycle A. C. motor, 5 feet of extension cord, reducing valves, fuel connecting hoses, and necessary connectors, etc.

Chemical Industries
522 Fifth Ave., N. Y. City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 175 QC 176 QC 177

Name .....

Title ..... **Company** .....

Address .....

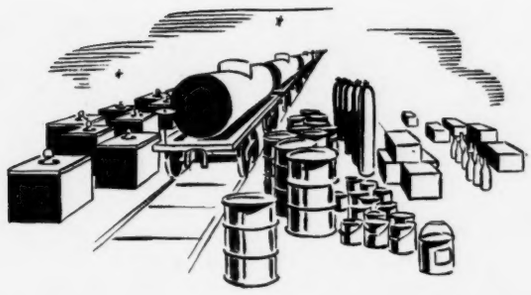
DRUMS of Texaco lubricants follow the United States Marines around the world! On land, on sea and in the air ... the airplanes and mechanized equipment of the Marines are cared for as carefully as their rifles and machine guns ... kept in shape for immediate action whenever and wherever duty calls.

Some of the drums we supply The Texas Company may have been on Wake Island...at Midway...at Guam... or may at this moment be accompanying Marine detachments on other heroic exploits. That, of course, we do not know.

But we do know that the Crown Drums we supply Texaco are made stoutly enough for service anywhere in the world.

CROWN CAN COMPANY, PHILADELPHIA, PA., *Division of Crown Cork and Seal Company.* Baltimore • St. Louis • Houston • Madison • Orlando • Fort Wayne • Nebraska City

INDEPENDENT AND HELPFUL CROWN CAN



PACKAGING & CONTAINER FORUM

By Richard W. Lahey

Explosives Rules Amended

THE I.C.C. has published several new and amended Regulations for the Transportation of Explosives and Other Dangerous Articles which become effective immediately, and they are mandatory on and after June 15, 1942.

As a result of an agreement reached among all parties of record, reports of accidents occurring on the highways by carriers subject to the Regulations shall be made to the I.C.C. instead of the Bureau of Explosives.

The following changes are of most interest:

1. Section 31(f). Periodic retests of metal tanks, safety valves. and heater systems of *tank cars* authorized for transportation of *inflammable liquids* and liquefied petroleum gases, now required as prescribed in section 31(f) *may be waived* because of the present emergency and until further order of the Commission.

2. Commodity List. *Potassium nitrate* mixed (fused) with sodium nitrite is to be added to the list as an inflammable solid and it may be shipped in 103W tank cars specially designed for this service.

3. Sec. 264 (0)(3). *Hydrofluoric acid* shipped in tank cars Spec. 105, 105-A500, or ARA-V. This change states that tank cars should be equipped with special valves and appurtenances approved for this particular service. Filling density must not exceed 90% of the pounds of water weight capacity of the tank.

4. Sec. 272 (g)(1). Authorizes shipment in single trip drums of *Sulfuric Acid* of 1.81 sp. gr. (65°Be) or greater strength or when strength is 60-65°Be, treated with inhibitor, rendering its corrosive effect on steel no greater than 66°Be commercial sulfuric acid. The specifications for this new single trip drum are numbered 17F.

5. Sec. 303(j)(3). For the duration of the emergency I.C.C.-3A *cylinders* may be charged with compressed gases other than liquefied or dissolved gases to a pressure 10 per cent. in excess of their marked service pressure. (Present regulations allow filling to service pressure only.)

6. Sec. 303(q)(1). Note 3 covers limitations of filling densities of *compressed gases* in tank cars such as anhydrous ammonia, hydrogen sulfide, carbon dioxide liquefied, etc. These filling densities are slightly changed with certain increases for shipments made during months of November to March inclusive, for the duration of the emergency only.

7. Sec. 357(a)(11). I.C.C. 22A or 22B plywood drums are added to the authorized list of containers for transportation of cyanides. This will allow the packing of 200 lbs. net per drum.

8. Shipping Container Spec. 15A covering *nailed boxes* not cleated, (style 1) single cleated boxes, (style 4 or 5) and double cleated boxes (style 2, 2½ or 3). The loading capacities are increased for these boxes when containers are constructed of "Group II" woods.

9. Shipping Specifications 17F is the proposed *single trip drum* for transporting *sulfuric acid* noted in No. 3 above. This drum is to be constructed of 16 ga. steel with 11 ga. or heavier chime reinforcements and to be of 55 gals. capacity only. Expanded rolling hoops are authorized with extra corrugations between hoops and chimes, required. Heads must be crowned to a minimum of ¾" and chime height must be 1¼". One opening of not over 2.3" diameter and one opening of not over ¾" diameter are authorized, both openings to be placed in one head only. Openings are to be welded and threads are to be standard pipe thread. The drop and hydrostatic tests are to be the same as prescribed for I.C.C. 5A drums which are 6 ft. drop filled with water onto solid concrete and an 80-lb. per sq. in. hydrostatic test maintained for 5 minutes.

10. Tank Car Specification 103A. *Safety vents* equipped with lead discs having ⅛" breather holes in center thereof are authorized experimentally for use in cars containing *sulfuric acid* (except oleum), *mixed acid*, and other fuming acids.

11. Tank Car Specifications 103B. The same lead discs in No. 10 above are authorized experimentally for use in tank cars containing *hydrochloric acid 20°Be.* and weaker and for other authorized fuming acids.

Container Plans Revised

Revised plans for the conservation, standardization, and substitution of oil drums and other metal containers used in the marketing of petroleum products were approved recently by the office of Petroleum Coordinator Harold L. Ickes.

In announcing approval of the revised plans, which had been drafted by the National Containers Subcommittee of the Petroleum Industry War Council, Deputy Coordinator Ralph K. Davies urged all marketers and consumers, whether urban or agricultural, to cooperate with the provisions of the plans by returning oil drums and other metal containers to their petroleum suppliers as quickly as possible.

Under ordinary circumstances reusable containers should be returned to suppliers within 30 days after their receipt, but in no instance should they be held more than 90 days.

In submitting its plans, the industry subcommittee made clear that petroleum companies are more interested in obtaining the return of the containers than in keeping the deposits.

"We cannot urge too strongly the cooperation of all consumers who purchase petroleum products in drums or other metal containers," the subcommittee reported. "Metal drums are scarce and getting scarcer. To meet all demands, we must speed up the turnaround of the containers now in service.

"The petroleum industry has pledged itself to try to get at least four round trips a year from each container. This pledge can be kept only if the industry has the full cooperation of all consumers."

Membership of the National Containers Subcommittee of the Petroleum Industry War Council is as follows:

Lloyd P. Lochridge, Sinclair Refining Company, New York, Chairman; L. C. Welch, Standard Oil Company of Indiana, Chicago; C. B. Prescott, Gulf Oil Corporation, New Orleans; K. W. Yeates, Wasatch Oil and Refining Company, Salt Lake City; J. M. Evans, Tidewater Associated Oil Company, San Francisco.

The plans follow:

Plan for Conservation of Containers

Pursuant to Section 1507.2 of Recommendation No. 14, Supplement, of the Petroleum Coordinator for National Defense, dated December 2, 1941, the Subcommittees on Containers, acting through the National Containers Subcommittee of the National Marketing Committee, Petro-

leum Industry War Council, have prepared the following plan for conservation of containers used in the petroleum industry:

1. That consumers, re-sellers and oil companies become more conscious of the need for prompt emptying of drums and other containers that must be re-used as often as possible to save materials.

2. That buyers of petroleum products in re-usable containers should empty the containers as promptly as possible and return empty containers to the petroleum supplier with all bungs and cover plates in place.

3. That petroleum companies retain title to their re-usable containers and urge their prompt return.

4. That petroleum companies should hereafter require the following deposits on re-usable containers at the time of sale of products delivered in containers, the amount of the drum deposit to be included as a separate item on the same invoice which covers the product delivered.

a. A minimum of $4.00 for the 55-gallon 18-gauge light steel drum and the 400-lb. grease drum.
b. A minimum of $3.00 for the 30-gallon light steel drum.
c. A minimum of $2.00 for the 14-gallon steel drum and the 100-lb. steel grease drum.
d. A minimum of $10.00 for the ICC 55-gallon heavy steel drum.

5. That drum deposits will be returned to depositors upon prompt return of the containers in good condition. In all ordinary circumstances re-usable containers should be returned within a 30-day period but in no instance should they be held outstanding more than 90 days.

6. That the invoicing of the deposit charge to agricultural customers should be on the same invoice as the product and payable on the same terms, without discount. Within the discretion of the seller where conditions justify, the seller may extend the return period which should, in no instance, exceed 6 months.

7. That, where re-usable containers move to outside distributors too distant to be returned to the refinery packaging the product, the refiner should work out an adequate sales charge to the distributor and that distributor, in turn, in selling the product to his customers, should require the same character of deposit and the same return of containers that the refiner requires on his direct sales. Such distributor must see that said containers are returned to use as promptly as possible by disposing of them to nearby refiners.

8. That loaning of steel drums of any kind or character for storage purposes be eliminated immediately. Any such drums now on loan should be recalled.

9. That no exception to the deposit plan be made in connection with railroad accounts or other large users who may desire exceptions, but such users must accommodate their operations and their accounting arrangements to the deposit plan the same as smaller users.

10. That the drum deposit plan should likewise apply to States, cities, counties and municipalities.

11. That users of drums should:

a. See that all bungs and cover plates are tight on empty drums and return the drums to the petroleum companies with these bungs in place.
b. Advise all their employees of the necessity of prompt return of all these containers when empty.
c. Caution all handlers of this equipment that these containers are essential to national defense and must not be abused, roughly handled or allowed to remain outside exposed to the elements.
d. Standardize on a minimum number of product brands necessary to meet their requirements, and accept shipments on a uniform flow basis, in this way avoiding the tying up of steel drums.

12. That shippers of the drums should caution all customers against over-buying; also they should attach labels or tags to all barrels, calling attention to the importance of proper preservation and prompt return in the interests of national defense.

13. That marketers should call to attention of their customers the fact that, while petroleum industry is enforcing regulations on drums, it is being done because the various governmental agencies realize the shortage of metals going into containers is acute and everyone purchasing petroleum products should make a contribution to the program for conservation.

14. That marketers should extend the delivery of fluid petroleum products other than canned motor oils direct to consumer outlets in bulk, in lieu of steel barrels wherever possible. This applies to existing facilities.

15. That marketers should institute a careful inventory control of filled and empty steel drums to eliminate surplus stocks.

16. That no person canning motor oil shall in any three months period deliver more than 6 one-quart cans of motor oil to each five-quart can. This means that approximately 45 per cent. or more of the canned oil volume will move hereafter in five quart cans in lieu of the 20 per cent. that moved in five quart cans in 1941.

17. That present bulk lubricating oil facilities should be utilized to the best possible advantage. This applies to existing facilities.

18. That all suppliers shall take positive steps to recover drums heretofore delivered on which no deposit was received. This is highly essential to the accomplishment of the plan.

Plan for Standardization of Containers

Pursuant to Section 1507.3 of Recommendation No. 14, Supplement, of the Petroleum Coordinator for National Defense, dated December 2, 1941, the Subcommittees on Containers, acting through the National Containers Subcommittees of the National Marketing Committee, Petroleum Industry War Council, have prepared the following plan for the standardization of containers used in the petroleum industry.

That the sizes and specifications of containers used for petroleum and petroleum products shall be as follows for the products indicated:

Steel Drums:

55-gal.	16 ga., ICC	Gasoline Lubricating Oils & Fuels
55-gal.	18 ga.	Lubricating Oils—Specialties
30-gal.	19 ga.	Lubricating Oils—Specialties
14-gal.	(*)20 ga.	Lubricating Oils—Specialties
400-lb.	18 ga.	Greases
400-lb.	28 ga.	Asphalts and Waxes
100-lb.	(*)20 ga.	Greases
Slack Wood Barrels		Crude Scale Wax

(*) These packages to be made on the same dies, the only differences in the package being in the head.

Oil Cans:

5-gal. Pail or Drum—Paneled—Black Iron 24 ga. .....Lubricating Oils—Specialties
5-gal. Round Can—Black Iron—24 ga. . .Kerosene
5-gal. Square Can—Black Paneled Black Iron .....Lubricating Oils—Specialties
2-gal. Oblong Can—Black iron .....Lubricating Oils—Specialties
1-gal. Oblong Can—Black Iron .....Lubricating Oils Specialties
5-qt. Can—Black Iron—4/5's to case .....Lubricating Oils
1-qt. Can Black Iron—24/1's to case .....Lubricating Oils

NOTE: In connection with the 5-Quart cans, arrangements are to be set up so that the volume of 1-quart to 5-quart cans will not be in excess of the ratio of six to one.

Grease Cans:

25-pound pail—Blank Paneled—Black Iron
10-pound can—Blank Paneled—Black Iron
1-pound can—Blank Paneled—Black Iron

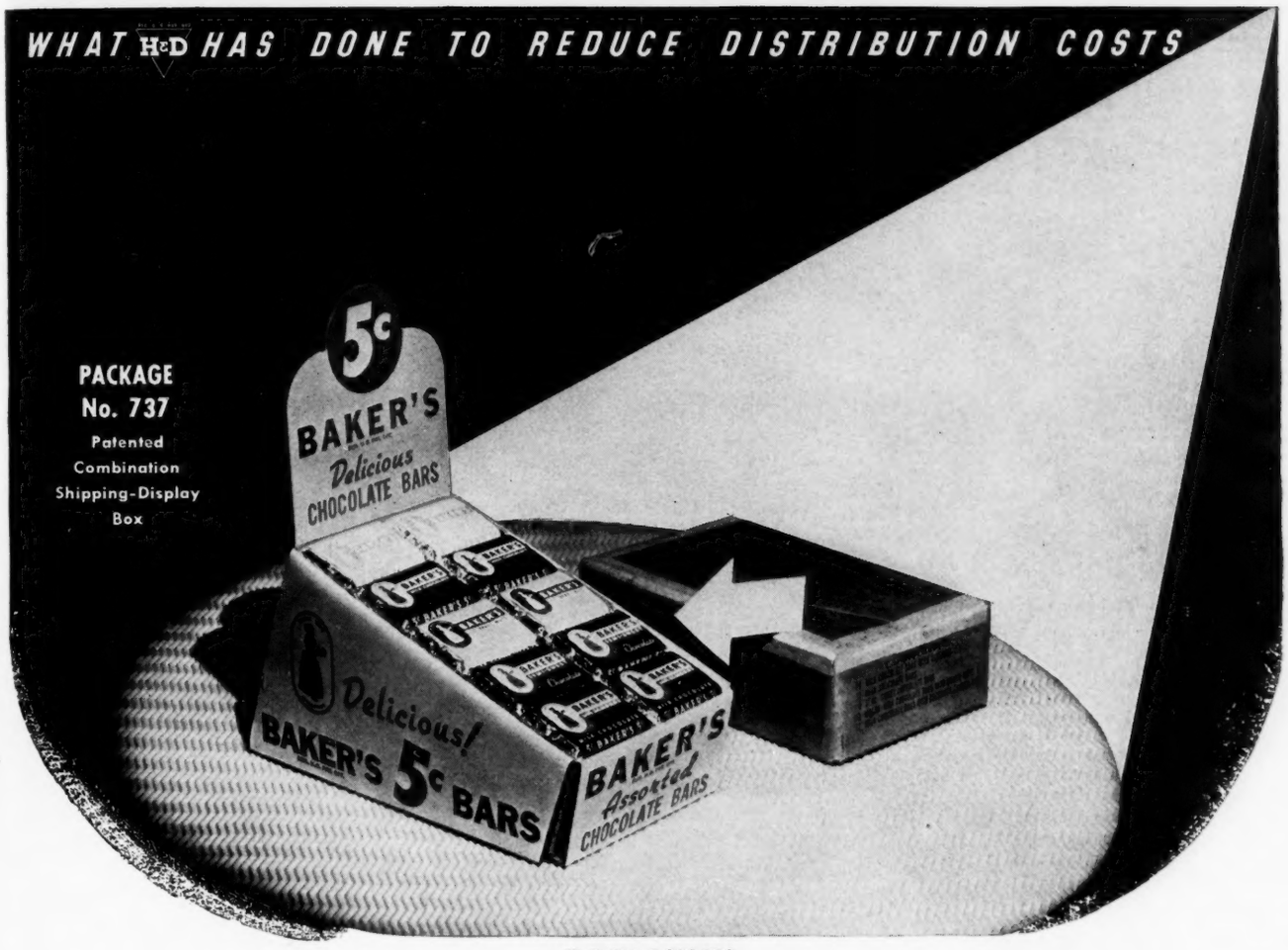
Specialties:

No Reference—Already provided for in Order M-81.

Pursuant to Section 1507.4 of Recommendation No. 14, Supplement, of the Petroleum Coordinator for National Defense, dated December 2, 1941, the Subcommittees on Containers, acting through the National Containers Subcommittee of the National Marketing Committee, Petroleum Industry War Council, have prepared the following plan for the substitution of containers made of materials other than metal:

1. That glass vessels should be used when possible as a conservation measure in replacement of copper and other metal measuring devices at service stations.

2. That wooden barrels be considered wherever practicable in the export trade, and in the domestic market for greases, unfiltered compounded cylinder oils and petrolatums.



U. S. Pat. 1,806,334

NICKELS ADD UP!

YES, nickels add up and they add up faster, too, when a small change in the design of a package transforms it into a double-duty box.

Economical? Look at this H & D package developed for Walter Baker & Company. One minute it is a full fledged shipping box . . . easily packed, sealed and shipped. In another minute it is a colorful, eye-inviting counter display.

Effective? Dealers like the compact, self-contained display features of this package. Simple to set up; no extra parts. Merchandise moves swiftly from manufacturer to dealer to consumer. Turnover is speeded, case-lot ordering is encouraged.

While H & D factories are on an all-out schedule producing shipping boxes for war materials and civilian essentials, you can use H & D's packaging skill to simplify your present shipping boxes as well as to create new sales-stimulating packages for the future. H & D Package Engineers are at attention, ready to go into action to help you solve your packaging problems. Take advantage of this specialized service today.

SAVE AND SELL WASTE PAPER

HINDE & DAUCH *Authority on Packaging*

1256 DECATUR STREET, SANDUSKY, OHIO

FACTORIES IN BALTIMORE • BOSTON • BUFFALO • CHICAGO • CLEVELAND • DETROIT • GLOUCESTER, N. J. • HOBOKEN
KANSAS CITY • LENOIR, N. C. • MONTREAL • MUNCIE • RICHMOND • ST. LOUIS • SANDUSKY, OHIO • TORONTO

PLANT OPERATIONS NOTEBOOK

Rubber Conservation

(Continued from Last Month)

Hot Water and Washout Hose

Hot water and steam hose such as is used in creameries, dairies, packing houses, etc., is frequently exposed to animal and vegetable oils which, because of the heat of the water are doubly active in hastening deterioration of rubber. By cleaning the surface of the hose and draining out the water after each day's work, hose life will be increased. Lying constantly in pools of water can water-log the cover and hasten deterioration.

Water Hose

Ordinary precautions that are too frequently overlooked can add to the life and service of water hose. For example, water should be turned off at the source, and not at the nozzle, when shut off for any period of time. It should be drained when not in use, especially when there is any danger of freezing. Do not let trucks, wheelbarrows, etc., run over water hose. Do not let it lie for long periods in direct sunlight.

Air Hose

In air hose, damage from oil is sometimes considered almost a necessary evil. Although oil-resistant compounds have increased the life of air hose many times in the last few years, care in protecting the hose from overheated oil can still add to its service life. Special helps to keep in mind are:

1. Keep compressors in good repair, particularly the "after-coolers."
2. Keep cover clean. Wipe off oil as soon as possible with clean waste or cloth. Wash off mud or concrete with water.
3. Do not use pipe nipples or ordinary shank couplings which are held in place with standard bands or clamps. High pressure couplings with clamps which fasten to the shank are safer. The quick detachable type is convenient and satisfactory for use on portable compressor and light pneumatic tool service.
4. Turn hose end for end at intervals to alternate positions of greatest exposure to oil, and also of greatest flexing.
5. Avoid kinks—and when they do occur, untwist with care.
6. Wash out with clean water and drain thoroughly if hose is to be stored.
7. When air tool is not in use for any length of time and job is still working turn off air at compressor to stop flow and open tool nozzle for outlet valve to release pressure on hose carcass. Trapped air under pressure weakens fabric or braid and shortens hose life.

Fire Hose

Storage. Storage is very important in care of fire hose. We recommend a flat-cured hose that folds flat for longer life. Hose stored in racks should have as few folds as possible, and the position of the folds should be changed about every three months.

Run water through unused hose at least twice a year, to lubricate the lining, and be sure to drain and dry thoroughly to prevent mildew.

Do not allow gasoline fumes to reach stored hose, since this has the same rotting effect as oil.

Use. When in use, hose should be protected from chafing, due to pulsation, at section nearest the fire pump.

Care should be taken to protect as much as possible from abuse such as having hose run over by trucks, while in use.

After Use

Care should be taken that hose does not freeze, but if freezing does occur, be sure that hose is not coiled or bent until it can be thawed out.

Keep hose clean! When in use, hose may be exposed to (a) oil and grease, (b) salt, or (c) acids. Oil rots rubber; salt retards drying action, leads to mildew; acids rot fabric cover. Wash and drain thoroughly and promptly after use, and if exposed to acid precede by brushing lightly with a 5% solution of washing soda.

Repair snags in jackets by darning, applying rubber cement, shellac, varnish, or other water repellent solution to prevent tendency to unravel and weaken the jacket.

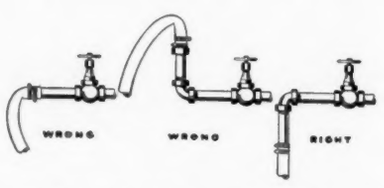
Instructions for Attaching Couplings

Couplings should be properly attached for longer life and greater safety. Many accidents occur, especially with compressed air or steam, because of improperly attached couplings and fittings. The following precautions should be remembered.

1. See that all burrs or sharp points are removed from stem of couplings or nipple. The end of stem should be rounded off so as not to cut the tube.
2. Coat the inside of the hose with soap solution or rubber cement and also apply to the shank. Insert shank quickly, before cement dries, for best results.
3. Take care to buy coupling with correct size stem. However, if the stem of the coupling is too large to enter the hose, do not cut away any portion of the tube, but turn the stems down on a lathe.
4. When attaching couplings of the seat or socket type, cut hose end as square as possible to allow hose end to seat properly. This will prevent fluid from leaking between the hose tube and cover and wicking its way through the hose, causing premature failure.

If the hose does not have capped ends (rubber covering over ends of fabric), apply several coats of rubber cement to exposed fabric. This will eliminate wicking or retard its progress.

5. Do not drive a coupling into hose with a hammer or mallet but force it in evenly and squarely after lubricant has been applied. Place the coupling in a vise and push the hose over the coupling sleeve.
6. Use clamps of *correct* size and draw them up tight. It is preferable to have a small space left between the lips of the clamp to allow for future taking up of the clamp. For best results, a special hose clamp vise should be used, on which the clamp is forced together by special jaws which grip the lugs on the clamp.
7. To couple wire-wound hose, turn the end of the wire at right angles so that it follows the hose and can be clamped down securely.
8. *Important!* After the hose is

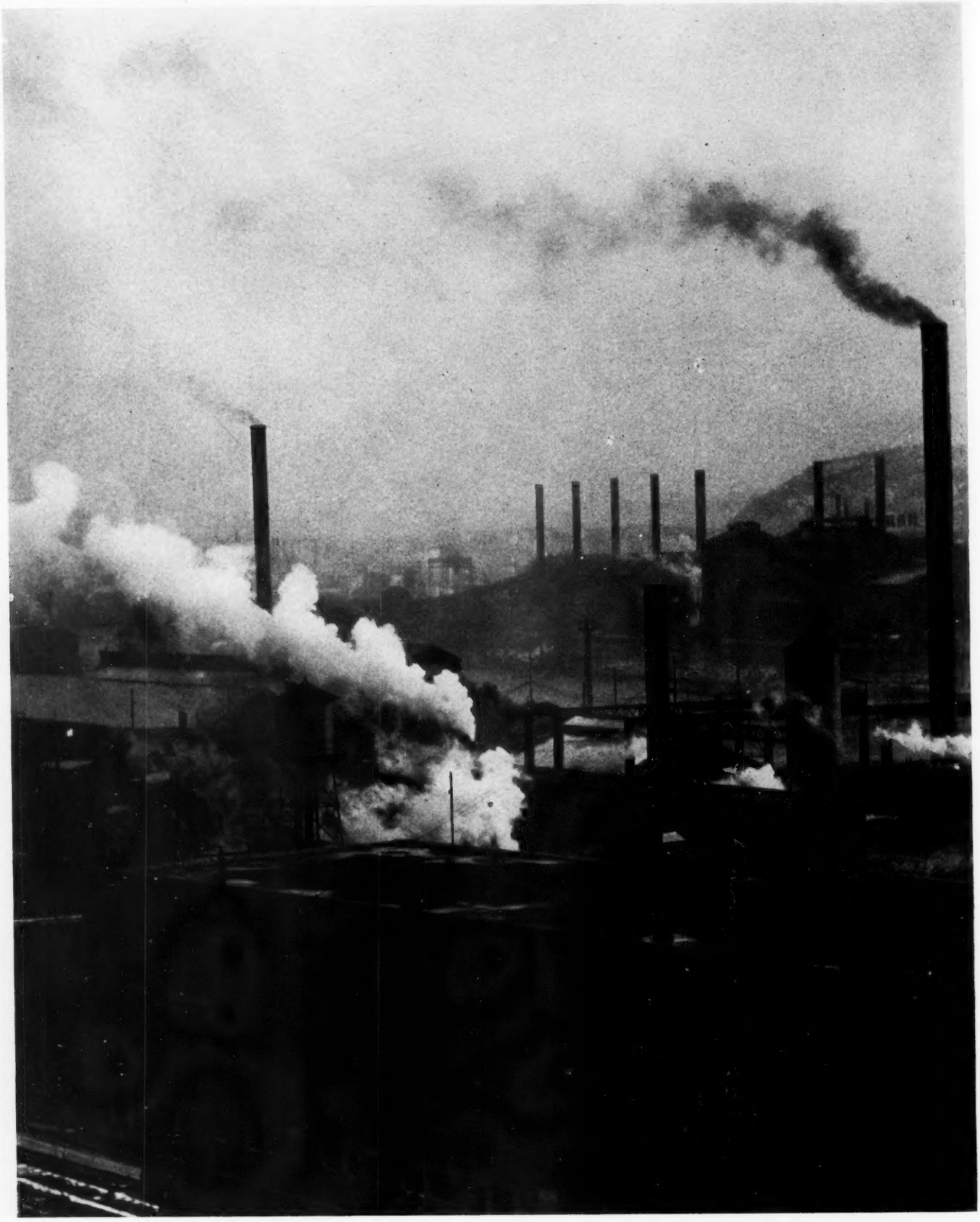


coupled, it should be mounted to hang in a vertical, or natural position, to avoid unnecessary strain. See illustration above.

CHEMICAL SPECIALTIES

Four new colors—Tropic Green, South Sea Blue, Aztec Brown and Patrician Purple—have been added to the regular line of Waterman's fountain pen and writing inks. They are bottled in 2-oz. convenient Tip-Fill bottles.

Industrial Agricultural Household



BOILER COMPOUNDS AND

As the wheels of industry turn at record speeds, an avalanche of power is being used. The treatment of water for steam-generating purposes has always been important to industry; now it is more so than ever. Here are some things you'd like to know about boiler water conditioning and some spots for further reading, if you so desire.

Left, all that steam means power for industry and at the same time it means more boiler water needs conditioning. Here is how it is done.

BOILER WATER CONDITIONING

By Benjamin Levitt, F. A. I. C.

Consulting Chemist

THE treatment of water for steam generating purposes is over 80 years old. It is based on extensive researches by scientists in private laboratories as well as those conducted by the Bureau of Mines and the American Association of Mechanical Engineers and other engineering organizations. The latter society has even set up a code for the condition of boiler water for proper operation and for the preservation of metal surfaces.

The aim of boiler water conditioning is to eliminate scale forming constituents, to prevent corrosion, foaming and embrittlement of metal surfaces.

The preparation of dosage for water treatment is not unlike that of a doctor's prescription—there are a multitude of variables to be considered in each. Just as each patient requires special treatment in accordance with symptoms and individual idiosyncracies, so boiler water needs a special formula in almost every case.

The intake of water may be from such surface origin as ponds and rivers, it may be ground water from deep wells, which has passed over various geologic strata such as lime, magnesia, silica, metallic ores, or it may even contain mine effluents. In each case it is obvious that the water will have dissolved many of the substances named, together with organic matter from decaying vegetation, carbon dioxide, oxygen, coloring matter and silt. Furthermore, the water may be neutral, alkaline or even acidic in character. Water containing these dissolved minerals is known as hard water.

Measurement of Hardness

Hardness is measured in grains per gallon or parts per million. It is determined by titration of a measured amount of water, with a standard soap solution. The point at which a good lather can be maintained for five minutes, over the surface of the water in a bottle, is noted on the burette, and the hardness is calculated from that. For further details on water analysis see Standard Methods of Water Analysis, published by the American Public Health Association.

Most of the dissolved substances are concentrated during the evaporation and consequently precipitate either as a sludge or even as a hard scale. Moreover, some water supplies are so dirty, that they require filtration or other treatment prior to their intake into the boiler.

Hard water is divided into two categories, temporary and permanent hardness. There are various degrees of hardness, depending on the amount of minerals in solution. Water containing 0 to 3 grains per gallon is called soft water; from 4 to 7 grains, moderately hard; from 7 to 12 grains, hard; and beyond this, very hard.

Temporary Hardness

Temporary hardness is caused by calcium bicarbonate, and this may be overcome by boiling, the reaction being:—

$$Ca(HCO_3)_2 + Heat \rightarrow CaCO_3\downarrow + CO_2 + H_2O$$

The calcium carbonate precipitates, and the CO_2 passes out with the steam. However, this is only part of the story. The residual hardness is caused by magnesium bicarbonate, which, upon being heated is converted to $MgCO_3$. This is soluble in hot water and may become concentrated and cemented with sulfate and other particles to form a hard resistant scale. Besides the bicarbonates, there may be the sulfates, chlorides, nitrates and other metallic salts which produce permanent hardness.

External treatment, that is, pretreatment of the raw water before it reaches the boiler, may be accomplished in several ways. There is the cold process and hot process, wherein the water is treated with chemicals to remove both temporary and permanent hardness, as well as to neutralize acidity, if any. By this system, the

scale forming impurities are either precipitated out or filtered. The chemicals, say lime and soda, are fed into a water tower, either continuously or at intervals, and after the reaction has taken place, the softened water filters through a bed of gravel, excelsior, coal, sand, etc. into another tower. These tanks are usually concentric, so as to conserve space. The hot process facilitates the reaction and so, has greater treating capacity. Soda ash, lime, caustic soda and a coagulant are generally employed. The coagulant forms a floc which effects speedy and thorough precipitation of the sludge.

As coagulants, ferric chloride, ferrous sulfate, copper sulfate and/or an alum or sodium aluminate and sodium silicate which forms a floc with the magnesia present, are employed.

The quantity of lime necessary, is calculated from the bicarbonates. The amount of soda ash required is determined from the amount of calcium and magnesium sulfates in the raw water.

While barium carbonate is sometimes used, is is not to be generally recommended. First because the chemical is poisonous, and should therefore not be used where direct steam is employed as in cooking edible products. Secondly, it is considerably more expensive than soda ash.

Unless there is excessive alkalinity in the raw water, soda ash will be required to neutralize the acidity of these chemicals. If an alkaline coagulant such as sodium aluminate is used, its alkalinity should be taken into consideration when preparing the formula.

By the hot process, the water may be brought down to a residual hardness of 0.5 to 1 grain per gallon. In the cold process, the residual hardness will run between 1 and 2 grains, under good treatment.

Internal Treatment

To accomplish satisfactory internal water treatment, that is, inside the boiler, chemicals must be added to convert magnesium sulfate and calcium sulfate to $Mg(OH)_2$ and $CaCO_3$ which are insoluble and consequently non scale forming. When soda ash is used, the $MgCO_3$ formed is further decomposed by the action of the soda ash, part of which is hydrolyzed to caustic soda (NaOH), under the influence of high temperature, and that in turn converts the $MgCO_3$ to magnesium hydroxide.

An excess of soda ash is used so as to combine with the natural CO_2 which is already dissolved in the water, and that formed by the decomposition of the bicarbonates. It is held by some, that the slight excess prevents corrosion and pitting.

Caustic soda should seldom be used for internal treatment. Its excess may cause embrittlement.

Another chemical commonly used in the internal treatment, is sodium aluminate. It is used together with soda ash or the phosphates. It also produces a floc with other undissolved particles. It is a caustic alkaline chemical and will replace some of the soda ash. It should be used in liquid form for internal boiler water treatment. It combines with dissolved silica to prevent silica scale.

In the light of researches of Hall and associates, the phosphates have been shown to be most effective as boiler scale inhibitors. If sufficient CO_3 ions are present in the boiler, they will combine with calcium to form non scaling $CaCO_3$ rather than the sulfates combining with calcium to form adherent sulfate scale. The proper amount of CO_3 may be maintained by the use of soda ash, but in high pressure boilers, that is undesirable on account of the break down of soda ash to caustic soda, which may cause embrittlement.

On the other hand, when using phosphates as the precipitating agents, calcium phosphate which is formed, being less soluble than calcium carbonate, is entirely precipitated from solution. It can be expelled from the boiler by blowing down. Moreover, by its use, in place of soda ash, lower alkalinity can be maintained in the boiler, and consequently there is no possibility of embrittlement, as with soda ash. While any of the phosphates may be used, sodium hexametaphosphate is the least alkaline of the phosphates, which contains the highest P_2O_5. It is therefore the most efficient. This particular phosphate also prevents feed line deposits.

Another point brought out by investigation, is that there should always be a certain ratio between the carbonate and sulfate. According to the A. S. M. E. code, the ratio of soda alkalinity to sodium sulfate should be 1:1 for boiler pressures to 150 lbs.; 1:2 from 150 to 250 lbs.; and 1:3 for pressures over 250 lbs. Sometimes sodium sulfite or bisulfite must be added to maintain this ratio, in order to inhibit embrittlement.

Corrosion due to dissolved oxygen in the water, may be prevented almost entirely by mechanical means via deaerators and heaters, but for complete elimination of the remaining oxygen. sodium sulfite or a ferrous salt may be employed.

Chromates, nitrates and acetates are also classified as inhibitors. Alginates are said to produce a liquid sludge and to minimize foaming and priming, due to their adsorption of crystalline precipitates.

Tannin extracts from cutch, quebracho, mangrove etc. are used to inhibit pipeline scale. Starch is used to make scale flakey and less adherent, Colloidal graphite is also used for this purpose.

Boiler Compounds

No statistics are available on the amount of boiler compound produced. However, since almost every steam generating plant uses some method of treating water, the production of boiler compounds must total a fair tonnage.

Compounds are sold in several forms—there is the block or slug type, dry powder, and semi-liquid or jel types. Each has its proponents and merit in one direction or another.

Boiler compound is generally sold along with service. That is to say, that many of the boiler compounds are "tailor made," to satisfy conditions on the basis of samples taken periodically, from the raw water used and from each boiler. Then the compound is prepared and the dosage is recommended.

A slug of compound is prepared by mixing the chemicals with just enough water to form a paste. This is poured into a mould and allowed to crystallize.

City Buys Compound

The City of New York purchases the following compound:

Anhydrous Sodium Carbonate	76%
Trisodium Phosphate	10
Starch	1

and sufficient cutch or dry extract of hemlock oak or chestnut bark to yield two per cent. tannic acid.

U. S. Navy Spec. 13 C 3 G:

Anhydrous sodium carbonate	44%
Anhydrous disodium phosphate	47
Corn Starch	9

British Patent 513,386 by Georges Mouscadet dated Oct. 11, 1939 presents a unique type of compound—Graphite 85%, Powd. Aluminum bronze 9, powdered zinc 3, talc 3.

One of the most recent developments in water purification, is the application of ion exchange synthetic resins of the amine formaldehyde and tannin or phenol formaldehyde types, as well as numerous others which have been prepared. By treatment of water first by a cation-exchange resin in the hydrogen cycle, then by an anion-exchange resin, all the dissolved salts may be removed, thus obtaining almost the equivalent of distilled water. Resins have been prepared, which are stable to acid, neutral or alkaline hot or cold solutions. They have high capacity and can be efficiently regenerated. Some commercial water softening installations are now being tried out. Basic patents are U. S. 2,104,501, 2,151,883 1938 and 2,191,853 of Adams and Holmes.

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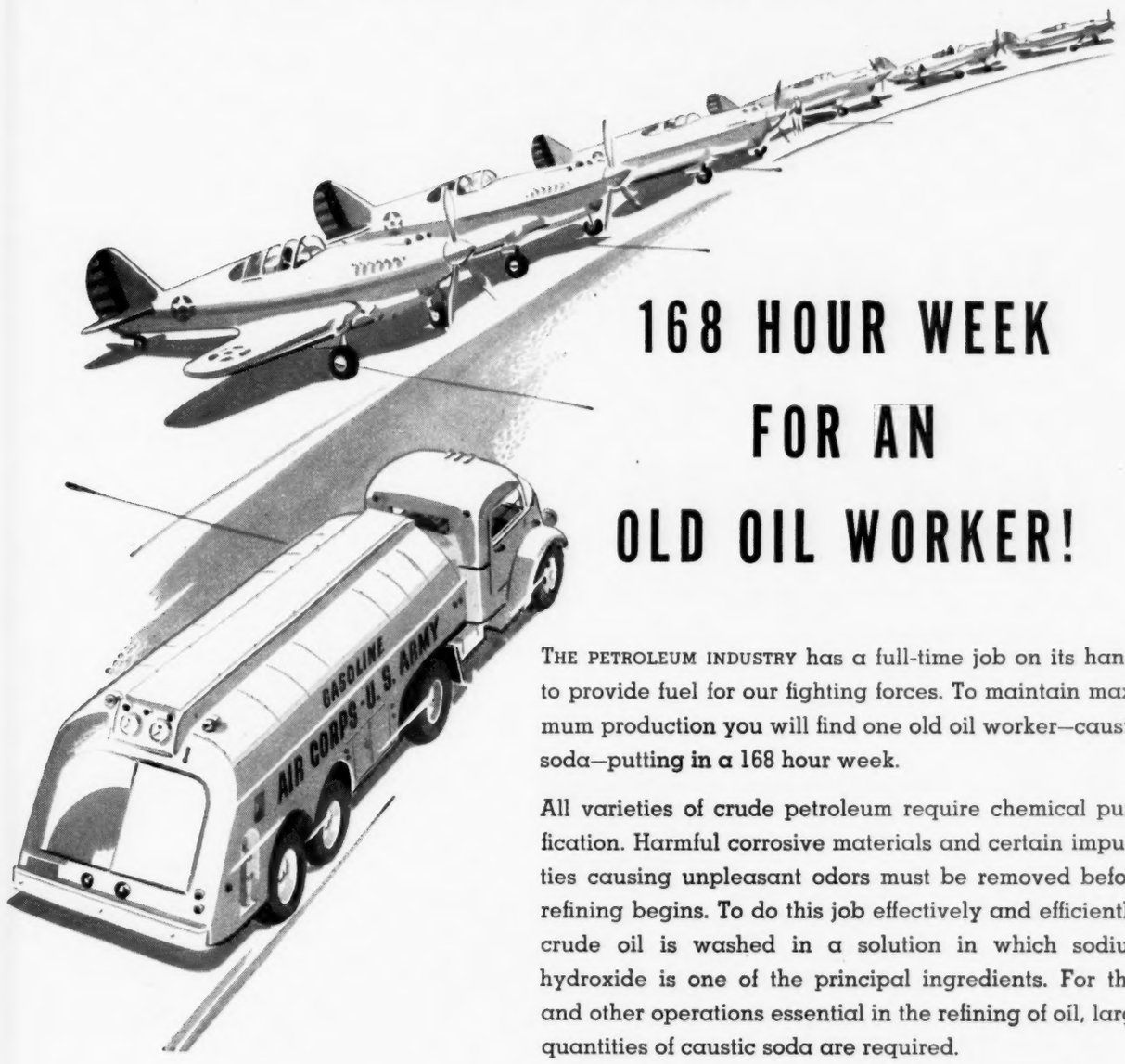
Boiler Feed Water Treatment—J. A. Holmes, Nat. Aluminate Corp.

Synthetic Resins as Exchange Adsorbents—Myers, Eastes and Myers. I. E. C. 697-706, 1941.

Boiler Compounds—B. Levitt, Chem. Ind. Aug. 1937.

CAUSTIC SODA

THE UNIVERSALLY USEFUL CHEMICAL



168 HOUR WEEK FOR AN OLD OIL WORKER!

THE PETROLEUM INDUSTRY has a full-time job on its hands to provide fuel for our fighting forces. To maintain maximum production you will find one old oil worker—caustic soda—putting in a 168 hour week.

All varieties of crude petroleum require chemical purification. Harmful corrosive materials and certain impurities causing unpleasant odors must be removed before refining begins. To do this job effectively and efficiently, crude oil is washed in a solution in which sodium hydroxide is one of the principal ingredients. For this, and other operations essential in the refining of oil, large quantities of caustic soda are required.

This is only one of the many industrial uses of caustic soda. It is equally essential for the production of rubber, textiles, soap and plastics. Dow has long been one of the major producers of this indispensable chemical and American industry continues to draw heavily on Dow for its caustic soda requirements.

Dow

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BICHROMATE OF POTASH

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1

What's New in the Chemical Industry

(1) Plastic-coated wall panels, a product of Barclay Manufacturing Co., N. Y. City, are available in three types (tileboard, panelboard, and streamlined board) and in 10 colors. Surface is waterproof, stain-proof, dirt proof and vermin proof. (2) Synthetic rubber thread made from Ameripol, (B. F. Goodrich product) is being used for vitally critical natural rubber in harness for parachutes, gas masks and respirators. None is available for civilian use. (3) Molded and extruded types of hard rubber made from Ameripol which will stand temperatures 100 degrees F. higher than product made from crude natural rubber. (4) Chamberlain Engineering Ltd., unit of U. S. Stoneware Co., has just purchased a 10-acre group of buildings at Ravenna, O., for the manufacture of "Tygon" synthetic rubber-like products. (5) Goodrich has developed this Flexometer for measuring the heat generation in rubber and the resistance to heat blow-outs of tires and other products. It is to be used by the British in improving combat life of war rubber products.

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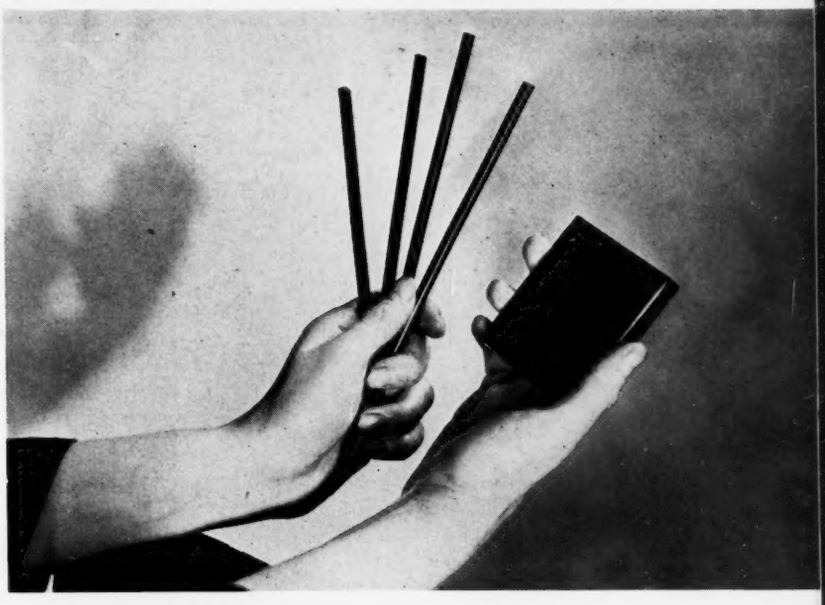

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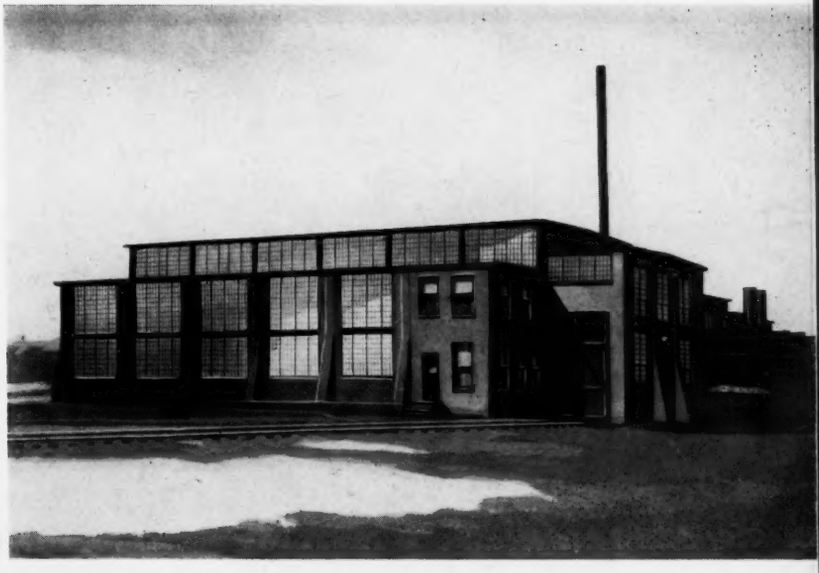

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Headliners in the News

Above, DeWitt (Tommy) Thompson, formerly an assistant sales-manager of Mathieson Alkali, reported for active duty as a lieutenant in the Naval Reserve Aviation Section April 15. He is shown here at a luncheon given in his honor at the Chemists' Club. Howard Farkas (U. S. Stoneware) at the left acted as toastmaster.

Below, left, Dr. L. W. Bass, who has been with Mellon Institute of Industrial Research for the past eight years, has been appointed director of the New England Industrial Research Foundation Inc. Right, Dr. Randolph T. Major, Director of Research for Merck & Co., Inc., who has been appointed to the Graduate Council of Princeton University.

Below, left to right, Dr. Lewis B. Miller has joined the consulting staff of W. H. and L. D. Betz, chemical engineers, Philadelphia. Robertson D. Ward has been elected assistant to the president of Freeport Sulphur Co. Richard C. Wells has been elected assistant treasurer of Freeport Sulphur Co.

Below, Dean E. McCrory, with the Pittsburgh office of the heavy chemical sales division of Pennsylvania Salt Manufacturing Co. since 1936, has been transferred to the company's executive offices in Philadelphia.

Below, standing, Walter Merrill, head of Joseph Turner & Co., has been commissioned a major in the Army air corps and reported for duty April 28. He is shown here at the April 16 meeting of the Salesmen's Association of the American Chemical Industry at the Chemists' Club at which he was called upon by Oscar Lind, president, (left), to say a few words. He was later feted at a luncheon by his friends in the industry.

Sharples MONOETHYLAMINE

$CH_3 CH_2 NH_2$

COMMERCIAL 70% AQUEOUS SOLUTION

Color	Water White
Sp. Gr. at 20°/20°C.	0.79—0.80
Flash Point	Below 0°F.
Water Insoluble	None
Monoethylamine Content	At least 70%
Average Wt. per gallon	6.63 lbs.

LITERATURE VALUES FOR ANHYDROUS MONOETHYLAMINE

Molecular Wt. (Also Equivalent Weight)	45.1
Boiling Point	16.6°C.
Vapor Pressure:	
DEG. C.	ATMOSPHERES
20	1.14
40	2.34
60	4.35
80	7.48
100	12.1
140	27.0
183.2 (Critical)	55.5
Heat of Vaporization at 15°C.	14.57 cal./gm.
Heat of solution in water at 19°C.	6330 cal. per mol. of solute at infinite dilution
Melting Point	−80.6°C.
Dissociation Constant at 25°C.	5.6×10^{-4}

Monoethylamine can be used in the synthesis of many nitrogen ethylated compounds. It reacts with aldehydes, ketones, carbon bisulfide, phosgene, chlorohydrins, sulfonchlorides, hydroxyaromatics, acid anhydrides, cyanic acid, thiocyanic acid and alkyl or aryl isocyanates.

Sharples will welcome opportunities to consider the manufacture of intermediates or finished products involving Monoethylamine as one of the starting materials. A number of derivatives can be made in existing equipment and many more can undoubtedly be produced by moderate additions to present facilities.

Monoethylamine is available from commercial scale production. A sample and the complete price schedule will be sent on request.

SHARPLES TRADE MARK CHEMICALS

SHARPLES CHEMICALS INC. • PHILADELPHIA • CHICAGO • NEW YORK

1

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Here & There in the Chemical Industries

(1) Harvey M. Harker, assistant general sales manager of the Organic Chemicals Division of Monsanto, arrived with Mrs. Harker in St. Louis last month from Melbourne, Australia, where he had been since 1940 as technical advisor in the new Australian affiliate. (2) Speaking informally, Col. Harry A. Kuhn, CWS, at the April 16 meeting of the Salesmen's Association of the American Chemical Industry at the Chemists' Club. (3) Caught in a rare moment at the Chemists' Club, John Chew of John A. Chew, Inc., and George Cooper, executive vice-president of Diamond Alkali, conversing over heaven-knows-what in a friendly manner. (4) Balcony view of one of the meetings at the 20th anniversary convention of the National Sanitary Supply Association at the Morrison Hotel, April 20, 21 and 22. (5) S. B. Penick, Jr., chairman of the Drug, Chemical and Allied Trades Section of the N. Y. Board of Trade, is shown presenting to Leon Fraser, Chairman of the American Red Cross War Fund of Greater New York, a check for $6,112.72, representing the net proceeds from the section's 17th Annual Banquet held on March 12. Others in the picture are John C. Ostrom, executive secretary; Victor E. Williams, Monsanto; and Robert B. Magnus, Magnus, Mabee & Reynard.

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If milk is improperly cooled at the farm or if milking machines and cans are not kept scrupulously clean, bacteria count rises alarmingly. Milk delivered to receiving stations with a bacteria count over 500,000 per cubic centimeter sours prematurely . . . is not worth pasteurizing!

Quick, positive check of the bacteria count is developed through the use of Methylene Blue in the Reductase Test. An aqueous solution of Methylene Blue colors good milk for 5½ hours. Not-so-good milk regains its whiteness sooner. If the "dyed" milk turns white within the hour, down the drain it goes!

Methylene Blue is one of many National dyes protecting America's health . . . another product of National Research — research that has expanded into the fields of Coating Resin Chemicals, Synthetic Detergents, Certified Food, Drug and Cosmetic Colors, Biological Stains and Indicators, Anti-Skinning Agents and other products.

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PROVIDENCE	15 Westminster St.	CHARLOTTE	201-203 W. First St.	CHATTANOOGA	James Bldg.
CHICAGO	357 W. Erie St.	GREENSBORO	Jefferson Standard Bldg.	PORTLAND, ORE.	730 West Burnside
PHILADELPHIA	200-204 S. Front St.	ATLANTA	140 Peachtree St.	TORONTO	137-145 Wellington St., W.

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LINED STEEL DRUMS AND PAILS

for absolute protection of chemical products during shipment and storage

EACH new chemical product we receive for packaging is tested in our laboratory, assimilating actual filling and storage conditions. Linings now in use are tested, or a new one is developed especially for the product, to provide a safe and positive protection when packed in *Steri Seald* lined steel containers.

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Makers of Steel Drums and Pails

WILSON & BENNETT
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LINED STEEL CONTAINER
JERSEY CITY • NEW ORLEANS
CHICAGO
No.

NEWS OF THE MONTH

GOVERNMENT

Price Ceilings Set

The Office of Price Administration, in a sweeping order issued April 28, put a ceiling on prices of chemicals, oils, paints and all other commodities except those specifically exempt by law or regulation and those covered by previously issued price ceilings not specifically revoked, at the highest levels prevailing during March.

The blanket order applies to prices at all levels for manufacturer, wholesaler and retailer.

Under the terms of the order: (1) Beginning May 18, retail prices, with a few exceptions, must not exceed the highest levels which each individual seller charged during March.

(2) Beginning May 11, manufacturer and wholesale prices and the prices for wholesale and industrial services must not exceed the highest March levels for each seller.

(3) Beginning July 1, no one may charge more for services sold at retail in connection with a commodity than he charged during March.

(4) Effective immediately, all retailers, wholesalers, manufacturers and sellers of services must preserve existing records of sales made during March for maximum pricing purposes when the ceiling goes into effect.

Order also provides for immediate licensing of all retailers and wholesalers. Later wholesalers and retailers will be required to register in writing on forms to be provided by OPA. Licensing and registration of manufacturers is not made clear in the order.

Order further provides that every retail store must publicly display the ceiling prices for selected "cost-of-living" commodities on and after May 18. This list includes such items as aspirin tablets, liquid milk of magnesia, liquid codliver oil, Epsom salts, boric acid, castor oil and mineral oil, witch hazel and rubbing alcohol, hand and toilet soaps, dentifrices, shaving cream, ready mixed house paints, bulk and packaged fertilizer, and insecticides.

Simultaneously with the issuance of the general freezing order, the OPA broadened its list of selective commodities subject to specified price ceilings to include some 14 additional commodities or products. The prices of some of these were put back in some instances to Oct. 1, 1941, levels.

Also, seven temporary price ceilings were ordered revoked and the products placed under the general freezing regulation. Included in this group were oil paints and varnish, for which temporary ceilings were established recently.

"Highest price charged" means two things:

(1) Top price for which an article was delivered during March, 1942, in completion of a sale to a purchaser of the same class. Customary allowances, discounts or other price differentials cannot to be changed, except to lower price.

(2) If there was no actual delivery of a particular article during March, the seller may establish as his maximum price the highest price at which he offered the article for sale during that month. This permits the use of a list price if no completed sale occurred in March. Conversely, however, if there was a completed sale at a price under the list price the actual sale price must be used as the maximum. The "offering price" where used to set the maximum price cannot be a "freak" price quoted to open bargaining or one never intended to apply to a bona fide sale.

To cover articles that were not sold during March and had no offering price the seller must establish as his maximum price the highest price charged in March for the most nearly similar article. The seller cannot use his own discretion to adjust the maximum price for the new article up or down because it may vary in grade or quality or size but must adhere strictly to the March highest price of the most similar article.

GENERAL

Rare Chemicals Registered

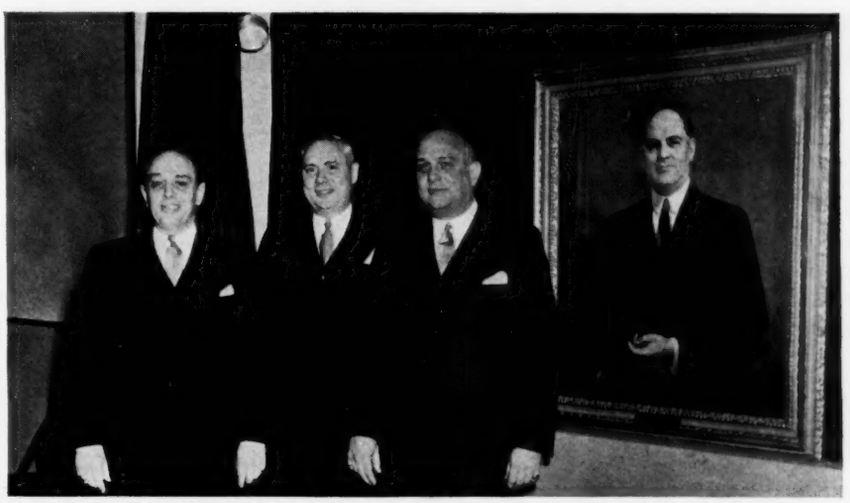
A clearing house for information about rare chemicals—to be known as the National Registry of Rare Chemicals—has been inaugurated by the Armour Research Foundation at 35 West 33d St., Chicago, in the interests of the scientific work of the nation.

To be maintained without charge, the registry will be directed by Dr. Martin H. Heeren, chairman of chemical engineering research in the Foundation.

The Registry is not a "chemical bank", inasmuch as it does not store the actual chemicals. It does not buy or sell materials, but merely maintains an indexed file of their sources. Chemicals which can be found in the catalogues of major supply houses are not included in the Registry. The file is regarded as a confidential trust and is not open to general inspection, but specific inquiries are answered by the Registry. This permits some individuals or organizations to remain anonymous as sources of chemicals in special cases wherein disclosure might reveal commercial secrets to competitors. In such cases the Registry will act as intermediary even in the ultimate transaction if desired.

Requests for file data have been made directly by mail of some 2,000 industrial and educational laboratories. However, it is impossible for the Registry to know all of the possible sources. It becomes the duty of each individual, laboratory, or industrial concern to cooperate in submitting voluntarily the information needed in the files. Prices which may be asked for chemicals are of no concern to

Magnus Brothers Unveil Their Father's Portrait



The Magnus brothers, Percy, Joe and Robert, unveiled this portrait of their father, the late Percy Cecil Magnus, last month. Percy Sr. was the founder of the firm of Magnus, Mabee & Reynard, Inc. Prominent essential oil men, drug and chemical manufacturers, brokers, old friends, members of the family and company executives were present at the ceremony.

the Registry, but are matters of interest only to buyer and seller.

Replies to requests for sources will be made on post cards with attached return card. The return card serves the two-fold purpose of acknowledging receipt of the information, and submitting data on new chemicals which may have become available. Telegraphic requests will be answered by wire collect.

Navy Research at Mellon

Navy Department recently established a basic research project on problems relating to the operation of specialized aviation instruments at the Mellon Institute of Industrial Research, Pittsburgh.

The scientifically trained personnel working on this project in behalf of the Bureau of Aeronautics includes the following members of the Mellon Institute: Dr. George E. Barker, Senior Industrial Fellow, George E. Alter, Industrial Fellow, and Charles E. McKnight, Fellowship Assistant. Other specialists will be added to the staff as the research progresses.

Incendiary Research

A cooperative arrangement has been effected between the Bureau of Mines, the Chemical Warfare Service, and the University of Maryland through which work on investigation of problems relating to putting out incendiaries will be done at the War Department Civilian Protection School, College Park, Md.

ASSOCIATIONS

Frey Elected N. Y. A. C. S. Head

Dr. Charles N. Frey, director of research of the Fleischmann Laboratory of Standard Brands, Inc., New York City, was elected chairman of the New York Section of the American Chemical Society at the annual meeting of the Section, which comprises 3,000 chemists and educators in the metropolitan area, May 8 at the Hotel Pennsylvania. Dr. Frey succeeds Dr. Ralph H. Muller, professor of chemistry at New York University.

Dr. Vincent du Vigneaud, head of the department of biochemistry of the Cornell University Medical School, New York City, was named chairman-elect to take office in 1943. William W. Winship, manager of the New York Office of Thermal Syndicate, Ltd., of England was reelected treasurer. Dr. Cornelia T. Snell, consulting chemist, continues as secretary.

New directors chosen include Dr. Charles O. Brown, consulting chemical engineer, 331 Madison Avenue, New

NEW N. Y. A. C. S. CHAIRMAN

DR. CHARLES N. FREY

York; Dr. Roland P. Soule, chemical adviser to Tri-Continental Corporation, and Dr. du Vigneaud. Drs. Frey, Snell, Müller and Mr. Winship also will serve on the Board.

Exposition Popular

Leading chemical companies of America are to be represented with exhibits at the National Chemical Exposition, which will be held Nov. 17 to 22 at the Stevens Hotel in Chicago. List of exhibitors already under contract and many who have made space reservations include the names of some of the country's most outstanding firms in the chemical industry.

Junior Engineers to Meet

Junior Chemical Engineers of N. Y. City will meet May 25 at 7 p. m. at Childs Restaurant, 109 W. 42nd St.

W. T. Nichols, Chairman of the Professional Guidance Committee of the A. I. Ch. E. and Chief, South Charleston Research Division of Westvaco Chlorine Products Corp. will speak on "Are You a Chemical (?) Engineer (?)?"

Tappi to Meet in Boston

Twenty-seventh Fall Meeting of the Technical Association of the Pulp and Paper Industry (TAPPI) will be held in Boston, Sept. 30 to Oct. 1, 1942. TAPPI Convention Headquarters will be established at the Hotel Statler.

A. S. T. M. to Atlantic City

More than 100 technical papers and reports are scheduled for presentation at the 45th annual meeting of the American Society for Testing Materials to be held at Chalfonte-Haddon Hall, Atlantic City, from Monday, June 22 through Friday, June 26. During this week there will be also more than 150 meetings of technical committees. Some 18 separate official technical sessions will be scheduled at which the technical reports and papers will be presented and discussed.

Textile Chemists to Meet

Annual meeting of the American Association of Textile Chemists & Colorists will be held in Atlantic City early in October, exact time and place to be announced later.

Some of the subjects which have been suggested for round table discussions are:

1. Dyeing wool and its blends
2. Cotton-mildew, water and fire proofed
3. Pigment colors vs. Vat dyes
4. Hosiery, then and now
5. Emergency substitutes—dyes, chemicals and processes.

Salesmen Meet May 19

Salesmen's Association of the American Chemical Industry will hear Dr. C. R. Addinall, Merck & Co., Inc., talk on "The Importance of Vitamins in the World Today," at a dinner meeting May 19 at the Chemists' Club, N. Y. City.

First golf tournament of the association will be held June 2 at the Garden City Country Club, Garden City, L. I.

S. A. E. Meeting Cancelled

Because of circumstances arising out of wartime conditions, this year's Annual Summer Meeting of the Society of Automotive Engineers will not be held. Instead, special local meetings and a special "Summer Meeting Issue" of the SAE Journal will be used.

Chemists at Atlantic City

Twentieth Annual Meeting of the American Institute of Chemists will be held May 16 at the Hotel Claridge, Atlantic City, N. J. New officers will be elected at the business meeting in the morning. The afternoon meeting will be devoted to a symposium on "The Chemical Industry at War", with the following speakers: Dr. Gustav Egloff, Universal Oil Products Company, "The Petroleum Chemist at War"; Dr. Donald Price, Technical Director, National Oil Products Company, "The Chemist in Today's Industry"; Dr. A. B. Ray, Carbide and Carbon Chemicals Corporation, "The Technical Point of View"; and Colonel O. C. Wyman, Liaison Officer, Third Regional Labor Supply Committee, "The Chemical Industry, Selective Service, and the War Effort."

The medal of the Institute will be presented to Dr. William Lloyd Evans, Professor Emeritus of Ohio State University, at a banquet to be held in the evening. Dr. H. B. Hass, Head of the Department of Chemistry of Purdue University, will discuss the "Career of the Medalist". Dr. Evans' acceptance address will be "Some Chemical Reactions of the Reducing Sugars in Alkaline Solutions."

Paint Clubs Meet

Louisville Paint and Varnish Production Club held its 153d meeting April 16. Edwin Edelstein, Newport Industries, Inc., addressed the Kentucky club on "The Adaptability of Resinates in Present-Day Formulation Problems Including Federal Specifications."

At the May 7 meeting of the New York Paint and Varnish Production Club, E. H. Bucy of the WPB spoke on "Camouflage Paints" and A. F. Schlandt, research director of the Pure Oil Co. spoke on "Petroleum Drying Oils."

Golden Gate Paint & Varnish Production Club met April 27 at Carlo's Inn, San Francisco, with an attedance of 47 members and guests. H. W. Crockett presided. Speakers were R. Nagel and Dr. E. B. Kester, of the Western Regional Laboratory.

April meeting of the Baltimore Paint and Varnish Production Club at the Belvidere Hotel feature a talk by Victor MacNulty of Hercules Powder Co. His topic was "The Application of Rosin Esters in the Varnish Industry." May meeting was addressed by Dr. A. R. Lukens, Thompson Weinman & Co., who spoke on "Significant Findings from a Study of Sub-Sieve, Low Refractive, Particulated Paint Pigments."

Henry L. Beakes, Kentucky Color & Chemical Co., spoke at the April meeting of the Pittsburgh Paint and Varnish Production Club on "The Production of Zinc Chromate Primers to Meet Specification AN-TT-P-656."

D. B. Becker of the Reichard-Coulston Co. spoke at the April meeting of the Philadelphia Paint and Varnish Production Club.

NEW REICHHOLD PRESIDENT

C. J. O'CONNOR

Charles J. O'Connor has been elected president of Reichhold Chemicals, Inc., succeeding H. Reichhold who becomes chairman of the board and will continue as general manager of all RCI plants.

The speaker suggested the creation of a Plastic Planning Board to solve the difficulties created by the severe competition for raw materials and to increase plastics production in the United States.

He predicted a shortage of plastics will develop unless the plastics industry and the government build new plastic chemical plants soon.

Merck Honors Soldiers

Dedication of a Service Flag for the more than 200 employees of Merck & Co. Inc. who have entered the armed forces of the United States took place at the main plant of the company, Rahway, New Jersey, on April 21. The ceremonies were conducted by a committee of employes who are veterans of the World War.

"All employes are making a definite contribution to national victory," declared President George W. Merck in addresing the assemblage. "Twenty-three years ago," he pointed out, "the Merck Service Flag carried 93 stars. This time there is more than double that number," he said.

R. & H. Changes Name

The R. & H. Chemicals Department of E. I. du Pont de Nemours & Co. after June 1 will be known as the Electrochemicals Department, the company announced this month. New name was chosen because it describes the type of products created by the department without being broad enough to encroach upon the activities of the nine other operating departments of the company.

Original name came about through the acquisition of the Roessler and Hasslacher Chemical Co. by du Pont in 1930.

Four plants located in New York, New Jersey, Michigan and California, are operated by the new Electrochemicals Department. At the latter, liquid hydrocyanic acid is manufactured for fumigating citrus trees. At the New Jersey plant is centered the company's participation in the ceramics industry. At its largest plant sodium and chlorine are produced electrolytically. Many other products are manufactured in the plants of this department including formaldehyde and an important line of solvents.

Monsanto Opens Trenton Plant

Monsanto Chemical Company's Trenton, Mich., plant was placed in production April 28. The new plant eventually will manufacture a group of industrial chemicals derived from phosphorus, which are being used increasingly in the war production program.

Continues Scholarships

Allied Chemical & Dye Corp. will continue its graduate fellowship plan in the academic year 1942-43. The recipients of the fellowships and the subjects are chosen by the universities; subjects are not restricted to those connected with the products or interests of Allied's operating divisions and subsidiaries. Stipend of each fellowship is $750.

U. S. I. News 10 Years Old

"U. S. I. Chemical News", a news-type advertisement familiar to readers of C. I. used by U. S. Industrial Chemicals, Inc. New York, celebrates its 10th anniversary this month by having appeared regularly for this length of time. The series probably establishes a record for the successful continuance of a "news" type of campaign.

Foundation Moves

Chemical Foundation, Inc., has moved from 654 Madison Ave. to 40 Wall St. N. Y. City.

So Does Interboro

Interboro Chemical Co. has moved from 296 Pearl St., Brooklyn, to 32 Cliff St., N. Y. City. Leon Cooper has purchased M. G. Rose's interest in the company and is now actively connected with it.

Washine Signs Up

Employers and employees alike of Washine National Sands, Inc., Long Island City, N. Y., have signed up 100% for the volunteer payroll allotment plan for buying War Bonds.

COMPANIES

Smokeless Powder Output Up

Production of smokeless powder in the U. S. on March 31, less than four months after we entered the war, had surpassed the peak output of the first World War, Charles A. Higgins, president of Hercules Powder Co., disclosed May 5 in an address before the Society of the Plastics Industry at Hot Springs, Va.

Neuberg Changes Name

Neuberg Chemical Corp., N. Y. City, has changed its name to Enco Chemical Corp. Officers and personnel remain the same.

Casey Taken Over

Industrial Sales Corporation, N. Y. City, has taken over the business of the naval stores firm of John A. Casey Company, Inc.

Steinmetz in Priorities

Steinmetz, "The Wizard of Schenectady," is the subject of the leading article in the May number of Priorities, house magazine of Prior Chemical Corp.

PERSONNEL

Hillary Robinette of Commercial Solvents Research Department has reported for active duty with the United States Army, Chemical Warfare Service. For the past two years he has been working on the textile applications of the company's new products at their laboratories in Terre Haute, Ind.

Other changes in Commercial Solvents personnel include the addition of **Cecil Carr** to their research staff at Terre Haute, Ind.

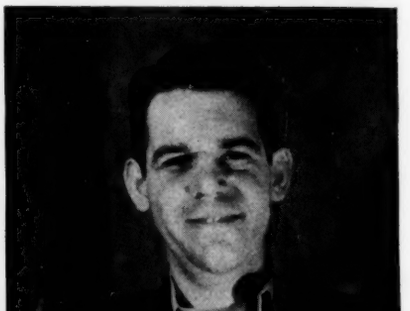
Robert E Lusk has been named vice-president in charge of merchandising and advertising for Colgate-Palmolive-Peet . . . **R. G. Phelps,** professional chemical engineer, has been appointed price executive in the chemical section of OPA . . . **Walter M. Fenton,** for the past three years manager of the Baker & Adamson division of General Chemical Co., and associated with that company for 13 years, has resigned his position to become a member of the executive staff of S. B. Penick & Co.

Charles M. Craighead has been named a research metallurgist on the staff of Battelle Memorial Institute, Columbus, O.

David Donovan has left the Advertising Department of Interchemical Corporation to receive a commission as Ensign in the United States Navy. He is now on active duty at the Naval Air Station, Jacksonville, Fla. . . . **Elon R. Brown,** formerly with Station KMAC, San Antonio, and the Lambert Pharmacal Co., St. Louis, has joined Interchemical's advertising staff.

Election of four Westinghouse executives to the rank of vice-president has been announced. They are **Andrew H. Phelps** of Pittsburgh, Pa., manager of purchases and traffic; **L. E. Osborne** of Philadelphia, Pa., manager of the steam division; **Frank C. Reed,** of Jer-

Monsanto Employees In the News



G. Lee Camp, left, retires on June 30 as a vice-president, member of the board of directors and co-general manager of the Organic Chemicals Division of Monsanto Chemical Co. He thus ends a 40 year career in the chemical industry on his 60th birthday anniversary.

Capt. Arthur Elwood Huff, right, former research scientist in the laboratories of the Organic Chemicals Division of Monsanto, was cited this month in dispatches from the Philippines for his bravery under fire. He was in command of Battery B of the 60th Coast Artillery on Corregidor.

Suggest Maximum Prices for Used Multiwall Bags

(Continued from Packaging and Container Forum)

Suggested maximum prices for used multi-wall paper bags, or paper shipping sacks, aimed to encourage conservation of kraft paper and to relieve the pressure of demand on burlap bags, were made public by John E. Hamm, Acting Price Administrator.

Investigation by OPA has shown that the demand for multi-wall paper bags may increase to 60,000.000 this year, or about 20,000,000 more than were used last year by shippers of salt, sugar, flour, cotton feed, and other food products.

Manufacturers and dealers reported to OPA that many shippers, confronted with a burlap bag scarcity, are using the paper bags for the first time and are not aware that the bags, when properly opened, can be sold to a dealer for reuse, in which case a substantial reduction on the original cost of the bags is effected.

Prior to the war only a few dealers were engaged in trading the second-hand shipping sacks but the burlap shortage has caused many dealers to seek additional revenue from the purchase and resale of paper sacks.

Both dealers and manufacturers, in preliminary discussions with OPA, have expressed satisfaction with the suggested prices for dumpers or users and dealers.

Prices below are for carload lot transactions. Recommended L. C. L. prices may be determined as follows: (1) Deduct 10% from price paid by dealer to dumper. (2) Add 10% to price paid to dealer by user. Bags will be bought by dealer f. o. b. source and sold by dealer f. o. b. destination or "full freight allowed basis."

In general, bags used for packing of food ingredients or products may be reused for packing a non-food product. Thus bags which are received primarily by baking concerns, confectioners, bottlers, canners and preservers, can be reused to ship fertilizers, sand, coal, kindling, sawdust, aluminum shot, plumbing supplies, and sewage and garbage for rendering plants.

Manufacturers have estimated that 75% of the 1942 production of new paper shipping sacks can be reused if the dumpers instruct their workers in the proper methods of handling the bags. Educational matter in the handling of the bags has been made available to the dealers and the users by the manufacturers and by the Paper Shipping Sack Manufacturers Assn., 370 Lexington Avenue, New York, N. Y.

Further price action in this field may be taken by OPA in the future if it is found to be necessary. See table below.

Table of Recommended Maximum Prices for Reclaimed 100# Multiwall Paper Bags

	Four Ply Bags		*Five Ply Bags*	
	Plain each	Printed each	Plain each	Printed each
A. Price paid to dumper by dealer	$.030	$.0225	$.0375	$.030
B. Price paid to dealer by user	.050	.0425	.0575	.050

sey City, N. J., president of the Westinghouse Electric Elevator Company, a subsidiary; and **Walter C. Evans** of Baltimore, Md., general manager of radio, x-ray and broadcasting divisions. All the new vice-presidents will continue in their present executive posts.

Robins Conveying Belt Co., Passaic, New Jersey, announces that **Alfred S. Otton** formerly advertising manager, now handles important productive assignments in connection with the war work now being done by the company. **John M. Lupton,** formerly assistant advertising manager, has been promoted to the position of advertising manager.

George S. Cooper, for the past five years vice-president in charge of sales for Diamond Alkali Co., has been elected executive vice-president . . . **C. N. Barney** has been made vice-president of Worthington Pump & Machinery Corp.

B. K. Moffitt has been appointed to the newly created post of Educational Director of Devoe & Raynolds Co. He formerly held a similar position with the United States Rubber Company.

Walter Geist has been elected president of Allis-Chalmers Mfg. Co. at a meeting of the board of directors held in Milwaukee on May 7. He replaces W. C. Buchanan, whose resignation was forced by ill health a few weeks ago.

Dr. Marston T. Bogert, professor emeritus of organic chemistry at Columbia University, has been elected honorary member of the Council of the Society of Chemical Industry, largest organization of industrial chemists in England.

Renshaw Smith, Jr., trade salesmanager and a member of the board of Devoe & Raynolds, Inc., paint manufacturers, has been appointed to the newly created position of Director of Priority Sales for the company. In his new post he will be responsible for the formulation and execution of priority distribution policy surrounding special bidding activity and all phases of trade sales priority volume.

Alan Kissock, vice-president of Climax Molybdenum Co., who has been in charge of its conversion plant at Langeloth, Pa., has resigned his position. **Arthur Linz** has been appointed vice-president to succeed him.

Edwin J. Schwanhausser, vice-president, Worthington Pump & Machinery Corp., has been elected to the corporation's Board of Directors, filling a vacancy created by the death of **Edward T. Fishwick.**

Noah J. Menard, member of the executive staff of the Rumford Chemical Works, has been admitted to practice before the bar of the District of Columbia.

J. R. Stevens of the Harshaw Chemical Co., Cleveland, was recently elected secretary-treasurer of the Purchasing Agents of Cleveland, Inc.

William C. McIndoe is on military leave of absence from his position as chemical engineer, market development section, Bonneville Power Administration, and is a Major of Field Artillery, somewhere in Utah.

Norman Baughn, with Cook Paint & Varnish Co. for the past 12 years, has joined American-Marietta Co. as a technical specialist in Army and Navy ordnance and Quartermaster Corps paints.

The R. & H. Chemicals Department (Electrochemicals Dept. after June 1) of E. I. du Pont de Nemours & Co. announces the following personnel changes involving its Solvent and Chlorine Products Divisions.

Edward W. McGovern, from the Chlorine Products Division to be Manager of the Solvents Division.

Nelson C. Cooper, from the Solvents Division to the Chlorine Products Division.

M. Marean, formerly Manager of the Solvents Division, to be Assistant to the Director of Sales.

Two Super Refractories that operate SAFELY at 3200° and 4000° F

TAM Zircon (Zirconium Silicate) refractories operate safely at temperatures over 3200° F. while TAM Zirconium Oxide refractories are used in applications over 4000° F.

These two TAM super refractories resist acids and oxidizing atmospheres. They are being successfully used in the manufacture of phosphates, fused silica, aluminum melting and platinum smelting. They're also widely used as crucible backing and for various high temperature applications.

An experienced staff of field engineers located in various parts of the country are available for consultations without obligation. Write:

TAM PRODUCTS INCLUDE

Zircon bricks, special shapes and crucibles . . . Zircon insulating refractories . . . Zircon ramming mixes, cements and grog . . . Zircon milled and granular . . . Electrically Fused Zirconium Oxide Refractories . . . Electrically Fused Zirconium Oxide cements and ramming mixes . . . Electrically Fused Zirconium Oxide in various mesh sizes.

TITANIUM ALLOY MANUFACTURING CO.

TAM ZIRCONIUM TITANIUM PRODUCTS Registered U. S. Pat. Off.

GENERAL OFFICES AND WORKS: NIAGARA FALLS, N. Y., U. S. A.
EXECUTIVE OFFICES: 111 BROADWAY, NEW YORK CITY
Representatives for the Pacific Coast States . . . . L. H. BUTCHER COMPANY, Los Angeles, San Francisco, Portland, Seattle
Representatives for Europe . . . UNION OXIDE & CHEMICAL CO., Ltd., Plantation House, Fenchurch St., London, E. C., Eng.

(*Continued from Page* 640)

It was with the realization that our production capacity of starch is almost unlimited, that Prof. Ed. F. Degering and David Rankin of Purdue University undertook the synthesis of derivatives of starch that might be utilized advantageously in times of both peace and war.

From the chemical viewpoint, these new derivatives of starch are very similar to Ethocel which is prepared from cellulose and ethyl chloride. Ethocel, introduced to the public during the past few years by Dow, is superior in many respects to cellophane, rayon, and other cellulose products of this type.

Ether derivatives of starch were prepared by Degering and Rankin by treating starch with methyl chloride, ethyl chloride, propyl chloride, and butyl chloride. These derivatives show a marked decrease in solubility in water and a corresponding increase in solubility in typical organic solvents in going from the methyl through the ethyl and propyl to the butyl ether. The propyl and butyl derivatives showed a marked tendency to form films similar to those obtained from Ethocel.

Insecticide Supplies in a War Period

In 1940 there were, according to R. C. Roark of the U. S. Bureau of Entomology, in cultivation in the United States 24,871,000 acres of cotton, of which 23,861,000 acres were harvested, producing 12,566,000 bales of 500 pounds gross weight each. The greatest acreage, 44,608,000, was harvested in 1926, but the highest production, 18,946,000 bales, was obtained from 33,623,000 acres in 1937, when the yield was 270 pounds per acre.

This enormous production would not be possible without the use of large quantities of many insecticides and fungicides designed to combat specific insect and fungus pests. The cotton plant is unusually attractive to insects, among which are some of the most destructive pests of agriculture.

The principal insecticides and fungicides used to combat pests attacking cotton and the estimated annual consumption of each are as follows:

	Pounds
Arsenicals:	
Calcium arsenate (includes some London purple which is calcium arsenate plus calcium arsenite)	40,000,000
Lead arsenate	1,400,000
Paris green	500,000
White arsenic	100,000
Fluorine compounds:	
Cryolite	400,000
Contact poisons:	
Nicotine sulfate solution (40 per cent nicotine)	32,000
Rotenone dusts (1 per cent rotenone)	250,000
Sulfur	20,000,000
Fungicide:	
Organic-mercury seed disinfectants	600,000

Sulfur appears to be the only material of which an abundant supply is likely to continue to be available during the war. Supplies of copper (an ingredient of paris green), lead (a constituent of lead arsenate), and mercury (used to make seed disinfectants) are already short. It may become necessary to ration arsenic, which is going in increasing quantity into the manufacture of glass now needed in greater amount to replace tin for containers.

All rotenone is imported, and the 1943 supply promises to be one-half of normal. More nicotine can be had only by using leaf tobacco, a procedure which is likely to boost the price beyond the reach of most farmers. It is imperative that insecticides be applied to cotton as effectively as possible in order to conserve the supply.

Miscellaneous Papers

Members of the Eastern Regional Research Laboratories reported at the meeting a possible shortage of 300,000 pounds of nicotine. Within the past year there has developed a considerable demand for its conversion into nicotinic acid.

Attempts to make up this deficit are along three lines. First, there is the development of more effective means of using nicotine as an insecticide. Possibly some of the new compounds mentioned above will help; possibly activators or synergistic materials will be found. Second, a considerable poundage of low-grade leaf tobacco of certain types will be diverted from the ordinary leaf channels to nicotine manufacture.

Such diversion has occurred during recent years and it may be expanded during the present year. A third possible source of additional nicotine might be the growing of *Nicotiana rustica*, a species of tobacco which is not used for smoking in this country, and which contains about twice as much nicotine as ordinary tobacco.

Utilization of Aliphatic Nitro Compounds

The most important aliphatic diol is probably glycol which is fortified with inhibitors and marketed under the trade name of Prestone, or used as an intermediate in the preparation of a number of derivatives, or nitrated to yield an explosive, or used as a solvent in certain pharmaceutical preparations.

Of even more importance is glycerol which is an aliphatic triol that forms the basis of the nitroglycerin industry. Glycerol is also used extensively in the production of various pharmaceutical preparations.

The importance of these diols and triols, the commercial availability of the nitroalkanes as the result of the work of Prof. H. B. Hass and collaborators at Purdue, and the ease with which the nitroalkanes condense with aldehydes suggested to Prof. Ed. F. Degering and C. Austin Sprang the desirability of condensing nitroalkanes with aldehydes under conditions that might yield nitrodils in satisfactory yields.

The nitrodiol prepared from formaldehyde and nitromethane, for example, is represented by the formula $HO.CH_2.(H)C(NO_2).OH$ whereas the formula for glycerol is $HO.CH_2.(H)C(OH).CH_2.OH$. The replacement of the one hydroxyl group in glycerol by the nitro group gives rise to a compound which the chemist characterizes as containing two functional groups, that is, hydroxyl groups and a nitro group. This increases the probable use of these compounds as selective solvents and as synthetic intermediates.

The work to date has been concerned primarily with the production rather than the use of these compounds, but once they are commercially available research will determine their most economical and effective use.

In the Vitamin Field

Dr. Norris D. Embree, at the Memphis meeting, announced the discovery of a new precursor to vitamin A. The substance was found during a research study on whale liver oil conducted by himself and Mr. Edgar M. Shantz at the Laboratories of Distillation Products, Inc., Rochester, N. Y. The new provitamin, which has been called Kitol (Kitol, from the Greek, ketos, a whale) is unique in two respects, in both of which it is diametrically different to a yellow plant pigment, carotene, the best known provitamin-A.

New Sulfa Compound

A series of new sulfa compounds has been synthesized, according to S. L. Ruskin and Mrs. Rosa Pfalz. The objective was to create sulfa compounds of physiologically occurring radicals, whereby the metabolism of the group associated with the sulfa radical would take place in selective tissues.

With this in mind the sodium sulfanilyl phenyl hydantoin was prepared. This is close in structure to dilantin sodium, commonly used for epilepsy and chorea. A streptococcus infection has long been suspected in chorea. The use of this especially constructed sulfa preparation promises to open up a new field of sulfa therapy.

Another group of physiological radicals tied to the sulfa type has been formed with nucleic acid and adenylic acid. These were prepared with the objective of producing a sulfa compound that would be less toxic in its influence on the white blood cells than sulfa compounds now in use. The particular objective is the creation of a sulfa compound that can be used in chronic conditions such as sinusitis and arthritis.

The synthesis of these new compounds represents a further contribution to the specific action of the sulfonamide drugs.

George G. Stoner has been named to the technical staff of Battelle Memorial Institute, Columbus, Ohio, and has been assigned to chemical research.

Wilmington Expands

In an expansion move which will enable the firm to double its employes and more than quadruple its production of naftolen, the Wilmington Chemical Corp. has purchased a site at Third and Heald sts., Wilmington, Del.

Naftolen is used in compounding natural and synthetic rubber. Through its use, it is stated, from 25 to 40% saving in rubber is effected.

OBITUARIES

Carl O. Johns

Dr. Carl O. Johns, 71, consultant chemist who was former director of the research laboratories and one-time member of the board of directors of Standard Oil Development Co. died April 17 of a heart attack at his home in Stamford, Conn. His home was in Manhasset, L. I.

Geza Szasz

Dr. Geza Szasz, 42, chemical engineer and inventor of equipment used in photography, died of a heart ailment April 23 at his home in N. Y. City. He was president of the Actina Corp. and the Electro-Copyist Corp., both of N. Y. City.

T. B. Norris

T. B. Norris, 58, for many years southern representative of the Corn Products Sales Co., died April 14 at his home in Atlanta, Ga.

Rene Weil

Rene Weil, 46, president of the metals, minerals and chemicals firm bearing his name, died April 17.

WASHINGTON *by T. N. Sandifer*

(*Continued from Page* 586)

ceilings, since so many of its products and raw materials enter into household or other articles of daily use; paper, paper products, raw materials of these, paints and varnishes, fertilizers in bulk and packages, and a range of other items from toiletries and drugs to table salt.

All members of the pulp and paper industry have been advised of WPB's policy toward that industry, which is to arrange for production of all essential pulp, paper, and paper products for direct war use, and necessary civilian use, in adequate quantities; to facilitate conversion of non-essential elements of such production to war purposes, to restrict the industry's use of critical materials by encouraging proper substitutes, curtailing maintenance and repair to basically necessary functions of the industry where these use critical materials, and by other regulations from time to time designed to meet such ends. Such regulations it has been emphasized will not depend upon voluntary industry action. An important phase of WPB policy involved cooperation with the Canadian pulp and paper industry.

Among pertinent WPB actions recently are:

A change in method of computing the permissible use of chlorine in treatment of rag stock, by amendment to General Limitation Order L-11;

Suspension of preference ratings against Acme Chemical Company, Inc. and Rona Chemicals, for alleged "Black Market" operations in scarce chemicals, in suspension orders S-41 and S-42;

Curtailment of use of benzene in motor fuel to conserve it for synthetic rubber production under M-137;

Office of Price Administration orders included:

Authorization to Harshaw Chemical Company, Cleveland, Ohio, to sell to Treasury Procurement Division approximately 45 tons of dynamite glycerine at a price reflecting only cost, but above the maximum in OPA Revised Schedule 38;

Issued Temporary Price Regulation 19 (Oils, Paints and Varnishes) stabilizing consumer prices for oil paints and varnishes;

Served notice of forthcoming amendments to Revised Price Schedule 53 setting specific prices for 125 varieties of fats and oils, which were generally forecast as planned to maintain the prevailing ceilings under which the industry has been operating;

Established maximums over all commodities and products sold for export;

Issued Rationing Order Number 3, defining procedure for both individual and trade, or industrial and institutional users, under Sugar Rationing.

A Traffic Advisory Committee on Industrial Alcohol, Distilled Spirits and Molasses, has been named by the Office of Defense Transportation to cope with problems arising from the alcohol production program; among its membership are H. W. MacArthur, general traffic manager for U. S. Industrial Alcohol, New York; and H. E. Seel, traffic manager, Commercial Solvents, Terre Haute, Ind.

EDITORIAL

Inflation Controls

(*Continued from Page* 610)

(4) The fourth point is the stabilization of farm prices. The President here recommends a return to parity level, or the purchasing power of farm products in the period, 1909-1914.

The present law permits farm prices to go as high as 110 per cent of parity and there is great resistance to a return to parity. It seems unlikely that Congress will vote this change. The farmers do not like the idea of labor being permitted to further its ends apparently without end while they retain a much lower standard.

5. The fifth point is the encouragement of the purchase of war bonds and here the President should have the backing of everyone. During the next year the Treasury's goal is a billion dollar monthly sale.

(6) The sixth point is the rationing of essential scarce commodities. Here, again, the President's attitude warrants full approval when he says that this is the "democratic, equitable solution."

(7) The seventh point is the restriction of credit which means the discouragement of instalment buying, encouragement of cash transactions and the clearing up of debts. This is wise advice. It may prevent many a headache after the war. In fact it is to be hoped that the Government in so far as possible will practice what it preaches in this regard of paying as you go and eliminating non-essential expenditures.

It is true that such broad controls as indicated in these seven points will pose many a question for a country that has to a great extent lived under a free economy. One of the gloomiest outlooks regretfully held by some is that through this kind of broad economic experimentation we may see the end of economic freedom.

However this view is far too gloomy. There were drastic controls in the last war which were discarded after the war when the law of supply and demand took over again. Whether these controls will be retained after this war will depend on conditions at that time. In this country there will be huge productive capacity, an expanded importance of research, new products and processes and much competition. There should also be a better understanding on the part of the public of the perfectly magnificent job of production that industry has performed in the war program and less antagonism to industry.

There will be opportunities and we shall make much of them. But right now everybody's job is winning the war.

BETWEEN THE LINES

Fluorspar plays a vital role in the production of aluminum. Here is a brief but authoritative report on grades, uses and prices.

DURING the coming months the American effort to treble its aluminum output will be felt in many directions—in new drains on electric power, gas, and in actions in otherwise seemingly remote fields. One of these reactions is in fluorspar, needed increasingly in the manufacture of synthetic cryolite, an adjunct in the aluminum production program.

Production of synthetic cryolite has made great progress, an important factor in the present plans for virtually establishing in the United States the equivalent of three aluminum industries of the size it had in peace.

Chemically, fluorspar is calcium fluoride, and is produced primarily in Illinois, Kentucky, and various Western states, the production conditions varying with these locations Thus, in the Illinois-Kentucky producing areas mines are close together, whereas, in the producing Western states, they are widely scattered.

Total domestic production of all grades last year was 320,669 short tons, Kentucky and Illinois accounting for 86 per cent of all finished fluorspar produced in this country, with all other United States areas accounting for 14 per cent. Domestic requirements have been helped with minor imports, but these do not figure strongly in present calculations.

In appearance it is a crystalline, frequently transparent substance, white, yellow, green, blue, red, violet, or brown, found in steep veins or funnel-shaped deposits along with calcite, quartz or similar minerals. Chemical analysis determines the use to which the various grades are adapted, but the material has to be concentrated for use; among such uses, in addition to cryolite manufacture, being its utilization as a flux in steel and ferro alloy production in the metallurgical industries.

Grades

In fact, the first of its three broad grades is devoted to the latter purpose; the grade known as fluxing or metallurgical grade. The next are ceramic grade, and acid grade. Grades are determined on the basis of CaF_2, an SiO_2 content. Fluxing or metallurgical grade fluorspar contains 85 per cent CaF_2 and five per cent SiO_2. Presence of other substances is a consideration, however, especially if these are likely to be detrimental in connection with intended use.

Other grades besides these three are sold for various uses according to chemical content, many consumers finding use for grades of fluorspar which vary considerably in proportion of CaF_2 and SiO_2 from standard.

Ceramic grade, one of the three standards, is generally that which contains from 90 to 95 per cent CaF_2, with from two to five per cent SiO_2, and as its term indicates, is utilized in the manufacture of certain types of glassware, or enamels for metals.

Acid grade is generally fluorspar containing even higher proportions of CaF_2, at least 97 per cent, and not over two per cent SiO_2. Again, the name designates its principal uses—manufacture of hydrofluoric acid, and particularly, this is the grade used in production of synthetic cryolite, needed in aluminum output. The commercial grade heaviest in proportion of CaF_2 as indicated by its percentage requirements in analysis, its production may be a very costly process, equipment frequently running from $100,000 to $800,000 for a flotation mill designed for producing this grade, depending on size of the mill.

Production Methods

Production of fluorspar also usually requires, grinding, crushing, milling, and sorting, as a preliminary to its use in the various manufacturing fields outlined above. This work is done by the mining producer at times or in other cases it is sold to organizations which mill and resell the fluorspar thus acquired. Due to the overhead involved in such processing it has been found that many producers prefer to sell the product as it comes from the mine, to such intermediate plants.

Deliveries may extend over a period of months, though priced at the start of operations. Only occasionally is fluorspar sold in packages, bags, barrels, or less than car lots. Generally it is sold in bulk, in carloads.

Recent indications of a possible jump in the price of acid grade, with its consequent effect, among others, on war production, together with apparent tendencies toward increased prices for the two other standard grades, but to a lesser degree, have led to price regulations in the past month which are now in effect.

However producers of 65 per cent of the product sold had earlier indicated that they would not exceed prices prevailing as of January 2, nor have there been any definite indications on the part of the other producers of an intention to greatly exceed these levels.

The Office of Price Administration evidently considered these findings as confirmation that the January 2 level was generally acceptable to the industry as fair, and have even stimulated output of fluorspar, especially the acid grade desired for war use. Furthermore, no allegations of excessive profits have been made, nor have consumers complained as to prices paid.

The January 2 price is stated to have been the highest since 1920, however, and as the OPA phrased the matter, any further increase was regarded as "inimical" to national requirements, as producers were advised early in the year. It is necessary to point out that the grades generally covered by current regulation are only commercial grades, and not the very high grades known as "optical" while prices, at the same time, are not limited in each case to fluorspar of identical chemical content.

The current action is regarded largely as preventive in character, rather than corrective, in view of the facts cited above. In connection with aluminum production, there are indications that current expansion of facilities will necessarily be on a higher price level anyway, with reference now only to other factors than cryolite, so that there is probably a natural inclination at Washington to weigh any further threat of price increases anywhere along the line. For instance, the exhaustion of available cheap power areas so far as aluminum plants are to be located, means that these must inevitably be built now in high-cost power zones.

In connection with this whole question of fluorspar in relation to aluminum output however, probably in the long run the dictum laid down by Donald Nelson a while back, on all war requirements, that this is not "a dollar war" probably will apply. In short, while money is not to be deliberately thrown around, outside suspicions to the contrary, it is not to be the criterion of production limits.

The broad uses of fluorspar industrially however, apart from aluminum indicate that some measure of price control is a part of the present wartime regulation of the whole national economy.

CANADIAN REVIEW

By Kenneth R. Wilson

SIX months ago this young neighbor of yours started something which the 150,000,000 inhabitants of North America are now going to try and finish.

Had you been tuned to a Canadian radio station the night of October 18, 1941, you would have heard the Prime Minister, Rt. Hon. W. L. Mackenzie King, announce to the people of Canada the most revolutionary price control measure ever taken by a free peoples, anywhere, at any time. The new measure came into effect on December 1 of last year. It froze the prices of all commodities and of essential services at the levels which prevailed during the four week period September 11 to October 15. Only prices of war goods and goods for export were excluded.

K. R. Wilson

This meant that the prices of chemicals, along with all other commodities, were "pegged" for the duration, at the prices which had prevailed in the "base" period. And because Canada pegged wages at the same time, costs were pegged as well as selling prices. A fundamental principle of the Canadian control plan was that you couldn't peg prices without pegging wages as well.

Canada's price control mechanism first started to work the hour war was declared on Germany—September, 1939. A group of clear-sighted economists and fiscal experts were at Ottawa and had previously drafted laws to create a Wartime Prices and Trade Board. It was given power to keep an eye on the "necessaries of life"; to avoid bottlenecks of supply; control prices and distribution of essential foods, clothing, shelter. It did not function a minute too soon because housewives with long memories started a sugar-buying spree on that first war week-end which called for prompt, decisive action.

For two years this Board kept an increasingly active hand on the controls. Mostly it was concerned with breaking up real or threatened supply shortages—seeing that wool, butter, coal, etc., moved freely into the regular trade channels. There was little recourse to price-fixing except rentals in certain war-congested areas, a temporary price lid on butter, and so forth.

By midsummer, 1941, the need for more drastic action was apparent. Canada's new comprehensive cost-of-living index had started rising at the rate of more than 1 per cent a month. The old, familiar inflationary symptoms were flying around. In a word: too much money, for too few goods. Prices were on the up and up.

Earlier than this, Canada had introduced a new and revolutionary principle into its economic wartime front. To halt the pressure of rising wage rates, the principle had been laid down as far back as December, 1940, that wages in war industry should be "stabilized" at the highest rates established between 1926 and December 1940. Above this, workers were to be entitled to a cost-of-living bonus amounting to 25 cents per week for each 1 per cent rise in the official government cost-of-living index. The plan was suggested originally as a "principle" to be applied in the settlement of all industrial disputes which came before official government tribunals. It was "recommended" for all other industries.

Wage-Fixing Mandatory

When Prime Minister King introduced his price-freezing program in October, 1941, he declared as well that this wage-fixing plan would be made mandatory on all Canadian workers. He announced the freezing of all salaries. Thus at one blow the Canadian government struck at the very heart of the wage-price spiral. It froze both prices and basic wage rates on the understanding that if there was any further upward rise in prices, wage-earners would benefit to the extent of 25 cents a week for every one-point rise in the cost-of-living.

Though wage and price controls were the most important individual measures taken by Canada in its nation-wide drive against inflation, the program was more comprehensive than that. What it amounted to, in total, was a five-point "blitz" against inflation. The stabilizing of wages and prices was supplemented by (1) curtailment of public spending power through taxation and public borrowing; (2) provision for increased industrial priorities and rationing; (3) the supplementing of agricultural income to maintain essential food supplies in the face of "pegged" retail or consumer prices.

All of these, it was recognized, were inter-related. Canada's economic experts argued from the first that you could not control prices without controlling wages, that you could not administer a price-ceiling unless you drained off excess purchasing power; that you might have to bonus farmers in order to avoid shortages which would ordinarily be cured by letting prices rise. As well, the experts convinced political leaders that the whole thing hung together and that there was not much hope of success if the job were to be done piecemeal.

Of most interest just now are the highlights and development of Canada's price freezing program.

Canada's Price Ceiling

Canada started out to introduce a price ceiling on all commodities at every stage of production and distribution. This was the Ceiling which Mr. King announced last October. It would have frozen every individual price "horizontally" from raw material up to finished goods. But it was soon found this wouldn't work. Instead, the policy which was initiated and which is now in effect is a "retail" freeze—a rigid ceiling on all *retail* prices. Behind this "front line" it became necessary to "roll back" the "squeeze" which obviously developed wherever there was a big time lag between production and consumption.

Canada adopted this plan in preference to a "progressive" type of ceiling which would have frozen prices at the producer level and permitted a forward price "roll" on the basis of established trade mark-ups. This decision was made in spite of the advice of many businessmen and merchants. It was done partly because a "progressive" ceiling would tend to penalize the wage-earner and primary producer as compared with the retailer and the manufacturer; partly because it was feared such a plan would start a new and perhaps uncontrollable chain of wage-price increases.

Argument still rages in Canada as to which plan is best. It has been proven that the retail freeze is not workable unless bolstered by government subsidy or occasional puncturing of the ceiling (so far, the government has invariably chosen to subsidize rather than "puncture"). On the other hand, many of the most ardent advocates of a "progressive" ceiling have had difficulty in proving that their plan would be universally successful or that it would be easy or feasible to control the wide spread in "mark-up" as between different types of business.

Measured by the cost-of-living index, Canada's price-freeze has been highly successful. Between February and November, 1941 prices rose about 9 points. The official index at the time the freeze went into effect was 116.3. For two successive months there was actually a fractional decline in the index. It now stands at 115.9. Meanwhile there has been a rise of approximately 4 points in cor-

(*Continued on Page* 683)

CHEMICAL SPECIALTY COMPANY NEWS

Gulick Urges Rotarians to Go "All Out"

URGING an "all-out effort" to keep alive the spirit of Democracy in these trying times, Charles P. Gulick, president and chairman of the board of National Oil Products Co., Harrison, N. J., warned members of the Plainfield Rotary Club at a recent weekly luncheon meeting that "Democracy never collapses; it vanishes with neglect."

Speaking on "America's Future," Mr. Gulick contended that the war is a "real challenge" to the belief of Americans in political, religious and economic freedom.

Production during the war period is one of the most serious problems facing America today, Mr. Gulick said.

"Modern wars are wars of machines—of tanks, of guns, of bombs, airplanes and battleships," he declared. "It is no longer merely army against army; it is farm against farm; it is the production of one country against the production of another country."

"The government must decide what kind of goods it needs, how many, and when it needs them. Actual production must be left to our factories. That is, industrial management must have the authority and responsibility for turning out the goods."

Discussing the period of readjustment when the war is over, Mr. Gulick said that the re-training of workers released from the army and from defense industries when the war is over will be necessary and that American industry should start making plans to that end now.

Development of new and improved products, new designs, new uses for old products, and improvement of production methods also will play an important part in readjustment, he said.

"American industry realizes the task that faces it," Mr. Gulick said. "It will willingly make what sacrifices are necessary. It will produce the machines and equipment needed to defend our freedom. It will do the job with a speed and efficiency that will astonish the world. American industry is proud of its ability to meet the present challenge. It will show that the spirit of freedom is the strongest power on earth; that no amount of slave labor can equal the voluntary co-operation of free men."

New Solvent Cleaner

Lixol, a new solvent emulsion-type metal cleaner, was introduced recently by the Cowles Detergent Co., Cleveland, O. This cleaner, company claims, is suitable for use on all metals and leaves an invisible oil film, ideal for painting or shop storage.

Product can be used alone or diluted with water or kerosene.

NOPCO School Is Out

Spring semester of the NOPCO Industrial School—a series of six lectures on metal working and metal lubrication—has just been concluded.

Dr. Edwin A. Robinson, Director of Technical Research for the Industrial Division of the firm, who serves as "Dean" of the Industrial School, instituted a new policy during the Spring course by inviting two prominent outside speakers to conduct classes. They were Benjamin McGar, Chase Copper & Brass Co., and Samuel Tour, Lucius Pitkin, Inc., both well-known in the metal working and metal lubrication field.

The Industrial School has been conducted at the National Oil Products company's Harrison plant for the past two years for laboratory chemists and other employees at the company. Various problems relating to the industries served by the company are discussed in an attempt to acquaint all employes with the latest developments in these fields.

In the past, courses have been conducted in rayon manufacturing, textile processing, textile finishing and dyeing, leather tanning and processing and paper manufacturing.

Evans Appointments

Following chemists were added recently to the staff of Ralph L. Evans Associates, research division of Evans Chemetics, Inc.:

Walter W. Edman, for the past two years with M. W. Kellogg Co., and for six years with Colgate-Palmolive-Peet. **Evelyn Klibaner,** formerly in the laboratory of the General Dyestuff. **Fred Linsker,** pharmaceutical and x-ray specialist. **Mildred Mellor,** formerly in the laboratory of Cheney Bros. Silk Co. **Carl Seybold,** formerly with Trojan Powder Co. **John Ross,** for a number of years with Max Factor and recently with Ponds Extract Co.

Company manufactures chemical specialties and private-label proprietary preparations.

Hand-wiping Solvent

Research and development laboratory of Curran Corp., Malden, Mass. has developed a new hand-wiping safety solvent which is to be marketed as a safety replacement for naphtha, gasoline, and kerosene in removing cosmoline out of rifles issued to troops.

According to A. F. Curran, research director, the new solvent is also applicable for wide industrial use as a superior naphtha substitute for grease cleaning and hand-wiping operations in ordnance factories or shell plants.

The new solvent is to be marketed under its blanket trade-mark of, Gunk XP-92; to be used as a concentrate and to be diluted with water.

This new solvent is described as a unique safety solvent because in spite of its high solvency against mineral oil or dirt, it does not de-oil the skin, has no toxic vapors, no flash or fire point, and leaves an invisible rust preventive film so thin it cannot be detected.

Rumford Gardens

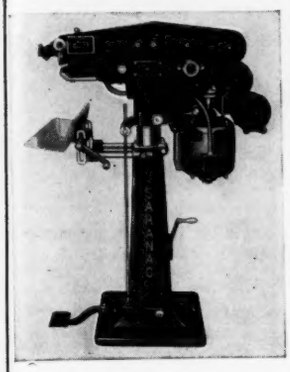
Cultivation of Victory gardens has become an organized war aid activity of the executives and employees of the Rumford Chemical Works, in Rumford, R. I.

The gardeners are cultivating plots of 100 feet by 40 feet on farming land supplied by the company. Besides getting the crops they raise, cash awards are providing an additional incentive to the Victory farmers to use their land efficiently. A. E. Marshall, president of the company and one of the gardeners, is offering cash prizes of $50, $15 and $10 to the three people who make the best use of their parcels, from the point of view of attractiveness and yield. The awards will be presented by a jury of judges composed of members of the faculty of the Rhode Island State Agricultural School.

Philly Paint Club Meets

Regular monthly meeting of the Philadelphia Paint and Varnish Production Club was held May 7.

Program consisted of a talk by Dr. Alexander Schwarcman, Research Director of Spencer Kellogg and Sons, Inc. The title of Dr. Schwarcman's talk is "New Drying Oils Developed Within the Last Few Years."



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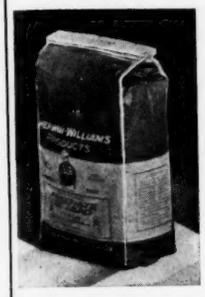

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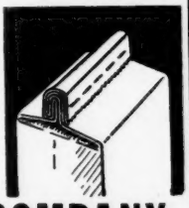

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MARKETS IN REVIEW

By Paul B. Slawter, Jr.

Heavy Chemicals — Fine Chemicals — Coal Tar Chemicals — Raw Materials — Agricultural Chemicals — Pigments and Solvents

BUYERS and sellers alike in the chemical industry this month are working on a solution to the biggest jig-saw puzzle yet to come out of Washington. On April 28 the Office of Price Administration put a ceiling on individual sellers future quotations and used his highest March prices as the base. The order became effective May 11 and thereby hangs a tale.

Although they had been told to expect such a move, few made adequate preparations for it. It had been foreshadowed in many ways. Now the atmosphere is one of complete confusion—manufacturers, wholesalers, jobbers, commission men, brokers, dealers and retailers—all find themselves not knowing what to do about their own special and extenuating circumstances.

Take a look at some of the questions which poured into the New York regional offices of the OPA. Telephone calls—1,500 in one day—and personal calls by the hundreds swamped the place. Here's what they asked (and they haven't been answered definitely, yet):

Can bona fide increases in production costs be added to the March prices? Can higher freight rates be added? Would March prices, based on February raw material costs, have to be retained for May deliveries of goods manufactured from raw materials of the Netherlands East Indies, raw materials bought in March at prices far above February purchases? What about fats and oils which are controlled mainly by the parity provisions of the Agricultural parity act?

And these are only a few of them.

Chemical and allied industries immediately took what steps they could. Individual studies were made of March prices and April and May values to date. No April advances seem to have been cancelled and the procedure was one of letting things go on as usual until May 11, which was legal anyway. Paint, varnish and lacquer manufacturers feel that March level prices will give them a wider range since many current prices are under those levels. Current prices on fertilizers are generally under the March prices giving this industry a break.

Whatever happens, don't forget that this is the law: "Effective May 11, all prices of manufacturers and wholesalers are frozen at the highest price level the individual made sales or offers at in March."

New Export License Forms—New license application form (BEW-119) has been adopted by BEW, replacing the "Yellow Form" heretofore in use. Although officially announced as obligatory May 20, it is understood that the new form should be used immediately. Copies are available at the NY Office of Exports, 500 Fifth Avenue.

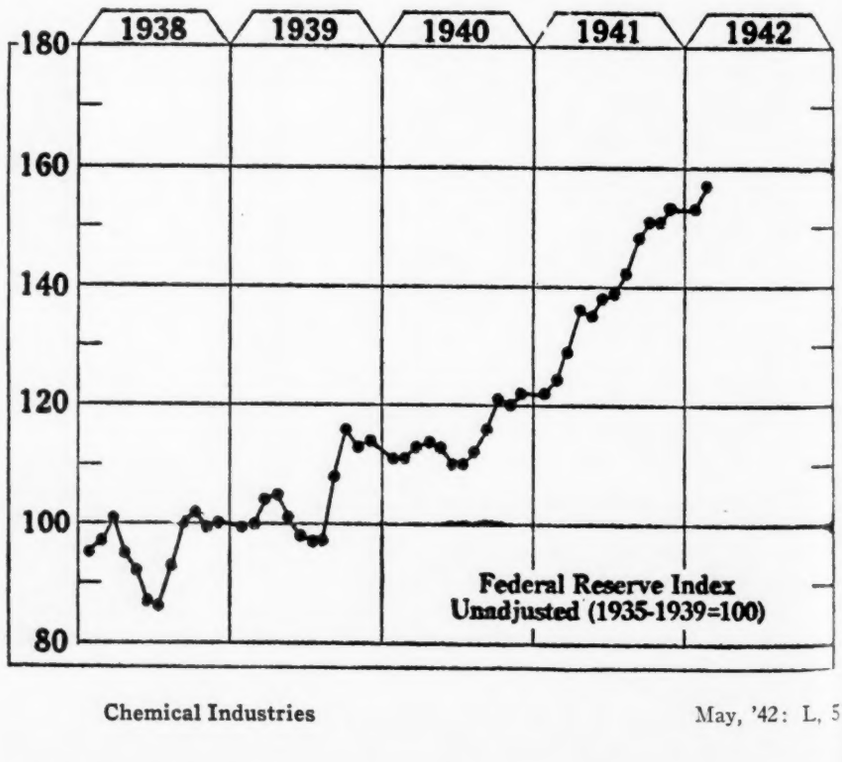
Allocations to Latin America—BEW has announced the list of commodities under allocation to Latin-American Republics, including those not heretofore allocated, for the second quarter of 1942, as follows:

Acetic acid
Acetone
Aconite
Ammonium sulfate
Anhydrous ammonia
Aniline
Camphor
Carbon tetrachloride
Castor oil
Caustic soda
Chlorine
Copper
Cotton linters
Dibutyl phthalate
Electrodes
Farm equipment
Formaldehyde
Glycerin
Leather
Ferro-manganese
Methanol
Molybdenum
Neat's-foot oil
Phenol
Phosphorus
Phthalic anhydride
Plastics
Potash salts
Potassium permanganate
Rayon
Red squill
Household electric refrigerators
Soda ash
Strontium chemicals
Sulfuric acid
Superphosphate
Tanning materials
Toluol
Tricresyl phosphate
Light trucks
Tungsten and ferro-tungsten
Ferro-vanadium
Wood pulp

Shipper's Export Declaration—Effective April 30, gross shipping weight in pounds must be stated on Export Declaration. Revised Declaration form must be used beginning June 1.

Heavy Chemicals: The American sulfur industry finds itself well able to cooperate with industrial users of sulfur who recently were advised by the WPB to build up stocks of sulfur at their plants so that possible future transportation tieups would not halt their operations. All sulfur production and shipment records were broken in 1941 and stocks at the mines decreased about 7%. The sulfur industry, however, during the first three months of this year, was able to exceed by about 8% the 1941 rate of production and increase by about 20% the rate established during the first quarter of 1941. As a result, stocks of sulfur at the mines on March 31 of this year were slightly in excess of the stocks at the end of 1941 in spite of the present accelerated demand and shipments. Producers of sulfur, therefore, have available ample stocks from which consumers may build up their reserves during the summer and so relieve the strain on the railroads during the fall and winter. Little change of price schedules is expected in heavy chemicals in spite of the recent ceiling order. Prices have shown very little fluctuation this year despite higher costs all around. Shipments of calcium chloride are increasing. Harshaw Chemical Co. was authorized last month to sell to the Treasury Procurement Division approximately 45 tons of dynamite

Trend of Chemical Production in the U. S.



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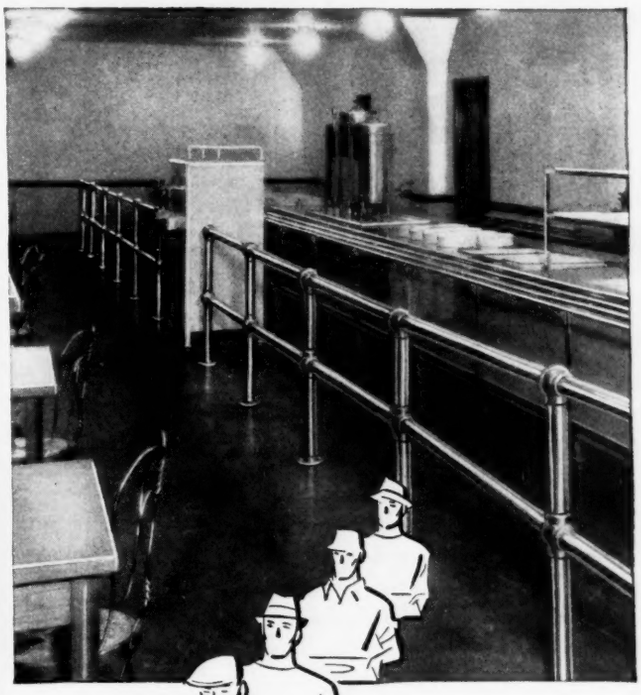

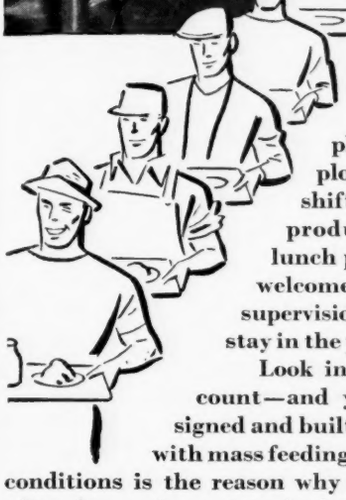

The lunch-time bottleneck is less of a problem in plants that have an employee cafeteria. Here lunch shifts can be staggered to fit production schedules. Short lunch periods still leave time for welcome relaxation. And less gate supervision is needed where men stay in the plant until the day is over. Look into plants where minutes count—and you'll find cafeterias designed and built by Pick. Wide experience with mass feeding under today's stepped-up conditions is the reason why Pick has been chosen so often for equipment to feed those who work. Whatever the size of your budget, a Pick engineer can help you, without obligation. Send for our illustrated 56-page book.

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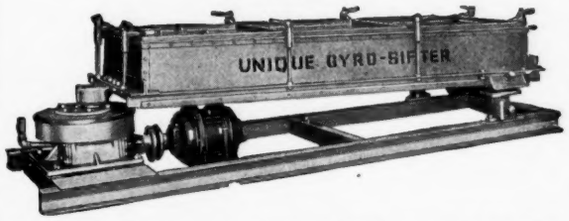

It was used in the most primitive hand sieves—a circular, jogging motion, diminishing as the load decreased. Applied to the UNIQUE Gyro-Sifter, it is the name of the curve which describes the travel of a particle down the length of a sieve.

More important, it vividly pictures the application of force to the sifting operation of this machine. The most severe agitation is at the head end of the machine, where the product must be evenly spread over the full sieve width, to utilize the entire clothing area, with progressive diminution as the tail is reached, and the weight of the tailing particles still sufficient to retain complete cloth coverage.

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Robinson Manufacturing Co.

86 Painter Street — Muncy, Pa.

glycerin at a price reflecting only costs. The concession was made by OPA in spite of maximum prices prevailing under Schedule 38 because the glycerin in question was refined from crude purchased in S. A. before the imposed ceiling went into effect.

WPB contract distribution office near you wants information on sources of supplies of activated charcoal for gas masks, white phosphorous and elementary chlorine.

Metals: WPB has announced a program to conserve substantial quantities of lead, antimony, rubber and other critical materials by limiting the production of storage batteries. Director of Industry Operations on April 25 extended until Oct. 31 the order providing for complete allocation of magnesium which was to expire April 30. Bureau of Mines Laboratories have developed a new process which makes possible the use of low-grade domestic chromite ores. Interruptions in the flow of copper to this country from Chile have ceased. Metals Reserve Co. has extended the purchase of price of tungsten at $24 per 20-pound unit to the end of 1943 to stimulate domestic production of the metal. Zinc oxide sales established a new high record in 1941 in both leaded and lead-free grades. A new order was issued last month by the Division of Industry Operations. This order limits the use of chromium in chemicals in the following instances:

1 The use of chromium is prohibited in the manufacture of roofing materials, ceramics, soap, and glass.

2 Chromium pigment is restricted to 90 per cent, by months, of the amount used in the year ended June 30, 1941.

3 The manufacture of chromic acid is restricted to 80 per cent of the base period.

4 Chromium used in tanning leather is restricted to 90 per cent.

5 All other uses of chromium as a chemical are restricted to 100 per cent of the base period.

6 Chromium used in the preservation of wood is restricted to preference ratings of A-10 or higher.

Fine Chemicals: The seasonal nature of this business is having the usual effect. Photographic chemicals are being sold in great quantities. Iodides, peroxides, sodium benzoate and other similar items are in great demand. What effect sugar rationing will have on consumption of tartrates and citric acid should begin to be felt soon. Formation of a traffic advisory committee on industrial alcohol, distilled spirits and molasses in the Office of Defense Transportation has been announced. Use of benzene in motor fuel has been prohibited by the War Production Board. This was restricted because benzene is a necessary ingredient of synthetic rubber. Stocks of the product already are increasing materially because of the restriction.

Special products department of one of the petroleum companies has informed this column that it now has available large quantities of normal pentane for sale in tank car or carload drum quantities either on a spot or one-year contract basis. If you're interested, drop a line and we'll have them get in touch with you. Typical properties are:

Boiling Range

IBP	94 F.
10% Evaporated	96 F.
50% Evaporated	97 F.
90% Evaporated	98 F.
Dry Point	99 F.
Reid Vapor Pressure	15.2
API Gravity	92.8

It looks very much like a reduction in price of mercury is due. Available supplies seem to be in excess of the demand. There are many inquiries for export materials in the fine chemicals market. Although the restrictions seem a little tough now, you can look for some adjustments to your benefit. The government wants to do everything in its power to promote trade. This applies especially to South and Central America. Distribution of naphthalene will be placed under rigid allocation control beginning June 1. All of the vitamin chemicals are selling like hotcakes.

Distribution and use of totaquine except as an anti-malarial agent has been prohibited by the WPB under a special amendment. Changing preference ratings have been announced for all permitted uses of chlorinated hydrocarbon solvents. Use and delivery of naphthenic acid was restricted May 5. Use of zinc sulfide pigments has been restricted by preference order of May 6. Maximum prices were established May 11 for fluorspar. Use of natural resins is restricted in any quarter to 50% of the amount used in the corresponding quarter of 1941. Use of rotenone was restricted April 13. Use of shellac was restricted April 14.

Fertilizer Materials: Prices that the nation's farmers pay for mixed fertilizer, superphosphate and potash have been stabilized by the OPA at the levels pre-

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Just for your general information about container substitutions, here is part of a chart recently issued by the Department of Commerce recommending alternatives:

Item	Original Material	Alternatives
Paints, Oils, Chemicals, etc.		
Acids, hot grease, water storage, railway and industrial uses.	Steel tanks.	Wood.
Calcium chloride.	Steel drums.	Pitch- or tar-lined paper bag.
Carbide.	Steel drums.	Steel necessary.
Paints, putty, resin, lard, greases, oils, polishes, waxes.	Steel (kegs and barrels); tin cans and other containers.	Molded pulp, resin lined (being developed); wooden kegs, pails, barrels, for bulk shipments in lieu of small cans; sheet iron with cellulose lacquer or paint coating; lead coating (80%): black plate.
Petroleum products and chemicals.	Steel.	Tight-stave manufacture.
Roofing pitch or tar.	Steel drums.	Wooden barrels; cardboard or paper.
Shaving and dental creams.	Tin and lead.	Moisture-proof cellophane and acetate cellophane.
Collapsible tubes.	Tin; lead; chlorinated rubber; vinyl compounds.	Thinner tin; plastics (balancing plastics against metals)—vinyl acetates, especially the softer types, hold most promise; polysterene plastics; nylon film; black iron plate; glass where possible.
Cooperage (slack or tight).	Steel, zinc.	Wood.
Crates (airplane, food, machinery, munitions, instrument).	Steel; plastics; aluminum.	Wood.
Kegs (nail and beer).	Steel.	Wood.
Luggage.	Chrome; nickel; steel, plastics.	Wood; fabrics.
Milk cans.	Nickel and tin.	Porcelain enamel finish.
Pails and tubs (laundry, dairy products, ice-cream, dye, food-packing.)	Iron; steel; zinc; copper.	Wood.
Tumbler closure.	Tin.	Light-weight glass lid.

(Continued on page 682)

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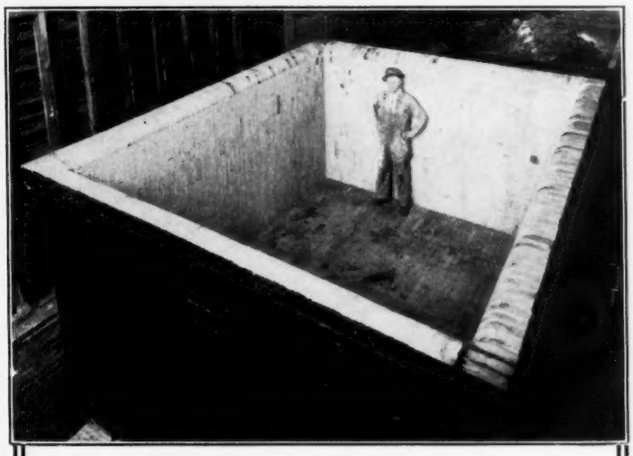
ST. LOUIS OFFICE: G. S. Robins & Company 126 Chouteau Ave.



Acid-Proof Linings

For chemical processing tanks and towers.
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MAURICE A. KNIGHT
202 Settlement Street Akron, Ohio

vailing since February under a previous maximum price regulation. Method of reducing maximum prices of meat scraps and digester tankage of low protein content has been changed to a protein basis by an amendment to maximum price regulation 74, effective May 5. Because of the need for ammonia for direct war uses, suppliers of ammonia in liquid form and of synthetic ammonia products (except sodium nitrate) have been requested by the WPB not to furnish any of these materials for fertilizer purposes from May 1 on until further notice. All manufacturers of sulfuric acid who use sodium nitrate in production have been requested to anticipate their requirements and keep suppliers advised at least 30 days in advance. U. S. Dept. of Agriculture has called for bids to be opened at 2 o'clock May 15 on 350,000 tons of 18, 19 or 25% superphosphate to be delivered between July 1 and Dec. 1.

Raw Materials: Additional cost of shipping paraffin wax in cotton bags may be added to maximum prices. Insecticides will be short this year, the experts say, next year they'll really be scarce. Prices of fats and oils probably will not change greatly in the next few months. Most items except butter and linseed oil, prices of which are not restricted, are now at maximum levels specified under Office of Price Administration Schedules 53 and 92.

Following the announcement in late March that the price of 92-score butter would be supported by the Dept. of Agriculture at 36c per lb. at Chicago the wholesale price advanced more than 2c. The higher level of butter prices is expected to stimulate production of milk and also to result in some diversion of the flow of milk from condenseries and cheese factories to creameries, thus increasing the supply of butter.

Prices of flaxseed and linseed oil have advanced materially in recent weeks, reflecting strength in the demand for paint oils, uncertainty concerning imports of flaxseed, and announcement of a supported price of $2.25 per bu. for Canadian flaxseed in store at Ft. William. Rising prices in the domestic market were followed early in April by a further increase in the price of Argentine flaxseed. The recent order of the War Production Board restricting new building is expected to reduce private use of linseed oil during the latter part of 1942, but increases in war demands for paint and varnish oils will tend to offset this influence on prices.

In early April an arrangement was approved by the President and by the Prime Minister of Canada to increase the production of oil-bearing crops in the United States and of oats, barley, and flaxseed in Canada. Without changing the existing tariffs, this arrangement provides more effective utilization of the joint agricultural resources of the two countries to meet wartime needs.

During March, the WPB issued orders restricting the utilization of coconut oil, babassu and other palm-kernel oils, palm oil and rape oil. Early in April, additional imported oils and oilseeds were placed on the list of commodities which private importers may not import without special permission from the WPB. Among these were babassu nuts and oil, castor beans and oil, cashew nut-shell oil and oiticica oil. Restrictions previously had been placed on private imports of coconut oil and copra, palm oil, tung oil and rape oil. Restrictions do not apply to imports by governmental agencies.

Naval stores market spring demands are extremely dull. Part of this was due to transfer of consuming industries from domestic purposes to war requirements. Loan documents are now in the hands of warehousemen and 1942 loans are in effect. More ships from the Gulf ports have been requisitioned thus wiping out the anticipated movement of rosin to South America in the near future. S. A. should be pretty well out of rosin by this time.

Materials Substitutions

Item	Original Material	Alternatives
Pigments		
Inks, coatings, fancy papers.	Chrome.	Organic yellows (also limited).
	Titanium.	Lead whites.
	Organic.	Changing from one color to another as shortages occur.
	Black.	None required.
	Vehicles for pigments: Linseed and petroleum derivatives.	None required.
	Tung and perilla.	Domestic drying oils (linseed and soybean oil); oiticica oil.
Coatings		
Overprint lacquers, fancy papers, artificial leather.	Nitrocellulose.	No direct substitute; natural gums may be used to limited extent.
Metal-decorating, bottle-cap coating; metal-container linings; inks; artificial leather.	Alkyd resins.	Linseed-oil varnish with natural gums.
	Phenol-aldehyde resins, solvent, and plasticizers.	Linseed-oil varnish with natural gums; vary combinations according to supply; use of less desirable plasticizers.
Plastics		
For multitude of packing uses.	Transparent wraps: Cellulose.	None needed for protective uses; for decorative purposes, glossy inks, lacquers, and finishes on paper base.
	Rubber derivatives.	Paperboard; light wood.
Complete packages; bottle closures.	Rigid sheetings; molded resins.	Paperboard, light wood; metal closures.
Metals		
Collapsible tubes, bottle closures, foil wraps, tin cans.	Aluminum; tin and alloys.	Tin-lead; other metals; transparent moisture-proof coated papers; reduce tin content; some plastics. Glass containers instead of tin cans.
Adhesives		
Package closures, tight wrap, paper coatings, labels, laminations.	Vegetable and animal glues.	Vegetable adhesives.
	Casein.	Corn or soya protein and starches.
Paper-box making and envelope manufacture.	Tapioca.	Sweet-potato starch (for postage stamps).
Sealing tapes and rubber cements.	Rubber.	Mineral-oil and turpentine compositions.
Corrugated packages.	Silicate.	None needed.
Labels, special closures.	Heat seal.	Animal glues; vegetable adhesives.
Package covering.	Artificial leather.	Embossed or other fancy paper.
Molded pulps.	Metal and phenolics.	Molded excelsior (with polymerizing solution).
		Peanut shells; colloidal clays; sawdust and other wood waste.
Printing.	Gummed Labels (adhesives and paper).	Four-color printing can be applied directly to bottles, cans, jars; eliminates gummed label and prints faster at half the cost.
		Washable inks used for "re-use" containers; one-color may be substituted for two or more.

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U.S.I. CHEMICAL NEWS

May ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1942

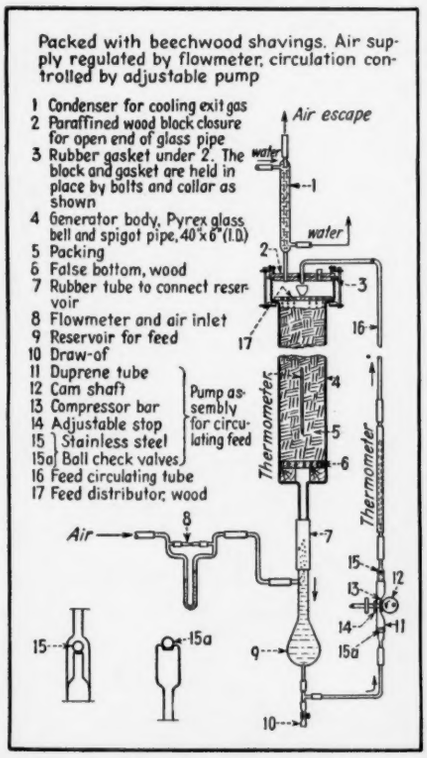
Novel Unit Devised To Provide Data on Vinegar Production

Laboratory Results Applicable To Full-Scale Manufacturing

The problem of applying laboratory results to full-scale manufacturing processes in the production of vinegar has been solved by means of a novel experimental vinegar generator devised by Dr. F. M. Hildebrandt, of U.S.I.'s Development Laboratory.

While processes for the manufacture of vinegar from alcohol have been well-known for some time, control data have been obtained largely by empirical methods. The new experimental unit is believed to offer, for the first time, an adequate means for duplicating on a small scale the process which takes place in large-size generators.

The experimental unit consists of a vessel packed with beechwood shavings on which vinegar organisms are growing. An alcoholic feed is continuously circulated over these shavings. Air is introduced into the lower part of the generator and the vapors escape from the top through a condensing system which reduces losses to a minimum. Details of construction are shown in the accompanying diagram.


Packed with beechwood shavings. Air supply regulated by flowmeter, circulation controlled by adjustable pump
1 Condenser for cooling exit gas
2 Paraffined wood block closure for open end of glass pipe
3 Rubber gasket under 2. The block and gasket are held in place by bolts and collar as shown
4 Generator body, Pyrex glass bell and spigot pipe, 40"x6" (I.D.)
5 Packing
6 False bottom, wood
7 Rubber tube to connect reservoir
8 Flowmeter and air inlet
9 Reservoir for feed
10 Draw-off
11 Duprene tube
12 Cam shaft
13 Compressor bar
14 Adjustable stop
15 Stainless steel
15a Ball check valves
16 Feed circulating tube
17 Feed distributor, wood
Pump assembly for circulating feed
Air escape
water
water
Thermometer
Thermometer
Air

Sketch of experimental vinegar generator, showing essential parts and flow of ingredients.

This apparatus provides control of the essential factors in the vinegar process. Air is regulated by means of a flowmeter (8). Temperature may be controlled by placing the entire unit in an incubator, and thermometers may

(*Continued on next page*)

Full Potentialities of Ethyl Acetoacetate Not Yet Explored

Known Chiefly as Dyestuff and Pharmaceutical Intermediate, U.S.I. Product Offers Many Other Fields for Investigation

While the commercial utility of ethyl acetoacetate has long since been established as an intermediate in the manufacture of dyestuffs and pharmaceuticals, an examination of the properties of this U.S.I. product definitely suggests further fields for investigation. Up to the present time, the chief applications of ethyl acetoacetate have been in the production of yellow pigment dyestuffs, and of antipyrine and amidopyrine among the pharmaceuticals.

A brief consideration of the organic structure of ethyl acetoacetate, however, indicates potential applications far more extensive in scope than the present commercial uses.

In Chemical Synthesis

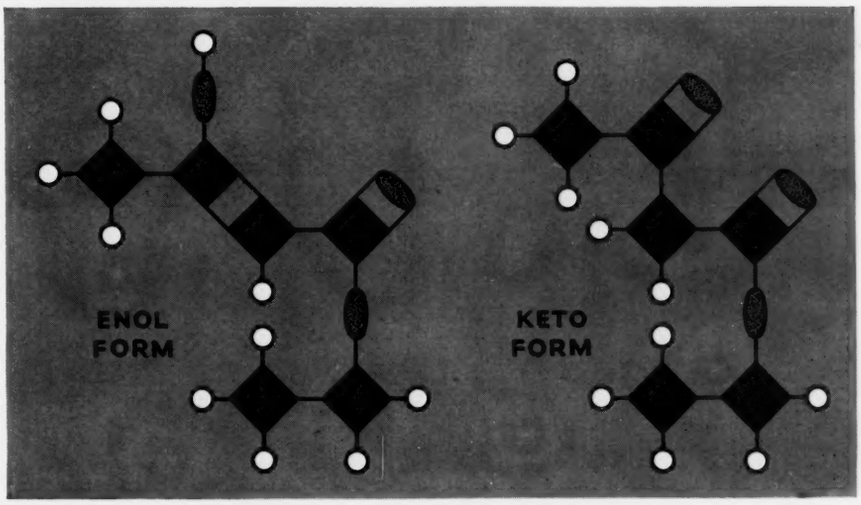
Two of the properties of ethyl acetoacetate are of special interest in organic synthesis. The first is the reactivity of the hydrogen on the carbon adjacent to the $-COOC_2H_5$ group. Hydrogen substitutions at this point lead to the introduction of groups such as halogen, metal, acyl, and alkyl radicals. Ammonia, aniline, urea, and many other compounds containing the $-NH_2$ group add with the elimination of water.

The second outstanding property of ethyl acetoacetate lies in the fact that the addition products just mentioned (particularly the amides) have a tendency to close into ring structures of the most varied types, giving, for example, substituted pyrroles, pyrazoles, pyrazolones, pyridines, isoxazoles, furane and coumarin derivatives.

U.S.I.'s development of processes for the production of ethyl acetoacetate on a tonnage scale has been a definite contribution to more extensive use of this chemical in many of its potential applications in organic synthesis.

In addition to applications of this type, there are other possible uses of ethyl acetoacetate that may merit further investigation. Because the product has become best known as an

(*Continued on next page*)



The chemical structure of ethyl acetoacetate shifts between the enol and keto forms. Both forms are shown in this diagram, in which hydrogen atoms are represented by circles, oxygen by ellipses, and carbon by squares. The square is used as the symbol for carbon, instead of the conventional tetrahedron, in the interests of simplicity and clarity in the diagrams.

U.S.I. Chemical News Marks 10th Anniversary

This issue of U.S.I. CHEMICAL NEWS marks the tenth anniversary of the initiation of an unusually helpful service to users of solvents, chemicals, and plasticizers in every branch of industry.

The first issue appeared in May, 1932, under the name of SOLVENT NEWS. The present name was adopted in May, 1940, to symbolize the growing diversity of U.S.I.'s activities and the broadening scope of the company's service to industry.

Throughout its ten years, U.S.I. CHEMICAL NEWS has consistently maintained the same policy — to provide useful information, in concise form, to the chemical-consuming industries. This policy will be continued without change in the future.

Study Potash Test Methods

LAFAYETTE, Ind. — Studies conducted here on the determination of potash in fertilizer materials indicate that appreciably higher potash values are obtained when 95% ethanol is used in place of 80%. These studies may bear out the belief of many fertilizer chemists that the determinations carried out with official test procedures, using 80% ethanol, give low results for the potash values.

ADVERTISEMENT—*This entire page is a paid advertisement.*

May ★ **U.S.I. CHEMICAL NEWS** ★ 1942

Recovers Ethyl Chloride From Butane Mixtures by Treatment with Ethanol

BATON ROUGE, La. — Ethyl chloride can be readily extracted from mixtures with butane by using ethanol as a selective solvent.

This discovery, made by an inventor here who has received a patent on the process, is expected to be of particular importance in the manufacture of tetraethyl lead. This compound is formed by treating a sodium lead alloy with an excess of ethyl chloride. In the past, this excess has been difficult to recover, because a side reaction results in the production of butane, which forms an azeotropic mixture with ethyl chloride.

A large portion of the ethyl chloride can be recovered by treating the butane mixtures with ethanol, which acts as a selective solvent having preferential selectivity for the ethyl chloride. Best results are obtained with aqueous solutions of ethanol, containing about 30% water, which is reported to give complete recovery of the ethyl chloride.

Novel Vinegar Generator

(*Continued from previous page*)

be placed inside the body of the chips, against the glass wall, so that readings of inside temperature may be taken.

The alcoholic feed is controlled by a special cam-driven pump, which is one of the most interesting features of the unit. The pump must be acid-proof and must deliver small quantities of circulating fluid continuously over long periods of time. In the design finally adopted, the pump is operated by a cam (12). The pump body consists of a length of gum rubber tubing (11), with check valves at top and bottom (15 and 15a). These valves consist of stainless steel balls in glass bodies.

In operation, the tube is compressed by means of a bar (13) actuated by the cam (12). When the tube is compressed, liquid is forced up through the upper check valve. When the pressure is released, fresh liquid passes into the pump through the lower check valve. An adjustable stop (14) controls the amount of liquid pumped at each stroke.

With a battery of such generators, it is possible to obtain comparative results by varying the different factors involved. Studies can be made of the results with different types of alcohol as the feed, with different rates of pour, or with various nutrients.

Sterols Easily Extracted With Acetone as Solvent

CHICAGO, Ill. — An entirely new approach to the problem of recovering sterols from oil-bearing seeds or from tall oil is suggested in a patent granted to inventors here and at Maywood. Basic factor in the new process is the use of a water-miscible ketone, such as acetone, in place of the water-immiscible solvents previously employed.

When acetone is used in the extraction step, only the sterols are extracted and the undesirable gummy materials are left behind, the inventors claim.

Ethyl Acetoacetate

(*Continued from previous page*)

intermediate, its utility as a solvent may not have received the attention which it deserves. It is true that ethyl acetoacetate has been suggested as a nitrocellulose solvent in compositions for the decoration of glassware, leather, and metallic articles. However, in applications of this type, it is not certain that the advantages of ethyl acetoacetate over other nitrocellulose solvents are sufficient to justify its widespread use.

A more interesting field of study would seem to lie in selective solvent applications. It has been previously reported, for example, that ethyl acetoacetate has been found useful in separating the unsaturated components of fish oils from the undesirable "break" and color components. (See U.S.I. CHEMICAL NEWS, December, 1940.) Examination of the solvent properties of ethyl acetoacetate may suggest other applications along these lines.

During World War I, ethyl acetoacetate was used to some extent as a plasticizer in cellulose acetate dopes, and this aspect may also repay further study.

U.S.I. will gladly discuss potential applications of ethyl acetoacetate.

New Book on Natural Resins

With natural resins now a center of interest, the publication of a new and authoritative text on the subject is particularly timely. "The Technology of Natural Resins," by C. L. Mantell, Director, Netherlands Indies Laboratories, C. W. Kopf, J. L. Curtis, and E. M. Rogers, is a valuable compilation of the results of years of laboratory research and industrial activity. Publisher is John Wiley & Sons.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

Toluol substitutes are said to be available in a number of different grades for such applications as printing ink, nitrocellulose lacquers, wax polishes, dry cleaning, and other applications. **(No. 570)**

U S I

A new fish oil is said to be particularly useful in the leather and metal trades. Maker says that product has less than 0.1% free fatty acids and saponifcation number of 163. Oil can be blown and used as a substitute for other blown oils now restricted, while in the metal trades it can be substituted for whale and sperm oil. **(No. 571)**

U S I

Accurate discharge from pipettes is provided by a new device, according to the maker. Device consists of a soft rubber bulb equipped with a valve at upper end and a soft bushing at bottom, for application on upper end of pipette. Bulb is held in hard rubber frame. Valve is said to limit suction, releasing liquid in desired quantities when finger pressure is applied on operating button. **(No. 572)**

U S I

A lanolin substitute is reported to be suitable for many industrial applications, and to be available for civilian purposes. Typical applications are said to include seals for water-carrying lines, dressing and finishing of leather, protective coatings for metals, and applications as a grease or lubricant. **(No. 573)**

U S I

A new paint is described as being formulated specifically to resist corrosion under the action of high steam pressures in the presence of sulfurous fumes and acids. Chief application is said to be the coating of interior surfaces of rubber vulcanizers to prevent corrosive attack. **(No. 574)**

U S I

Cement-asbestos pipe, manufactured by a new process, is said to be characterized by high density, great strength, and resistance to a wide variety of mildly corrosive solutions. For more severe service, the pipe can be supplied with coatings or linings that offer protection under highly corrosive conditions, according to the maker. **(No. 575)**

U S I

A heat exchanger for heating or cooling liquids and viscous materials is said to permit mixing, emulsifying, or aerating simultaneously with the heat exchange process. Design is reported to result in rapid heating or cooling. **(No. 576)**

U S I

A new liquid plastic is applied like paint to steel, concrete, wood, and other surfaces, and dries to form a tough, impermeable, dielectric film with high resistance to attack by acids or alkalis, it is reported. **(No. 577)**

U S I

A new feed water treatment makes use of an organic colloidal material, which is employed in conjunction with inorganic materials, such as phosphates or alkalis. It is reported that results obtained have advantages over those obtainable with inorganic materials alone. **(No. 578)**

U S I

A new wetting agent is recommended by the maker for use in conjunction with all types of alkaline metal cleaners. **(No. 579)**

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Amyl Phthalate
Butyl Phthalate
Ethyl Phthalate

OTHER ESTERS
*Diatol
Ethyl Carbonate
Ethyl Chloroformate
Ethyl Formate

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Acetoacet-ortho-anisidide
Acetoacet-ortho-chloranilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloranilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate

ETHERS
Ethyl Ether
Ethyl Ether Absolute—A.C.S.

OTHER PRODUCTS
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Collodions
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*Curbay Binders
*Curbay X (Powder)
Ethylene
Ethylene Glycol
Nitrocellulose Solutions
Potash, Agricultural
Urethan
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American Institute's April Speakers

The American Institute of Chemists, New York Chapter, held its April 17 meeting at the Chemists' Club, N. Y. City. Topic for the evening was "Unusual Industrial Opportunities for the Chemist." Donald Price, chairman, presided.

Dr. Harry L. Fisher

Dr. Harden F. Taylor

Raphael Katzen

John W. Robertson

Speakers included Dr. Harden F. Taylor, president of the Atlantic Coast Fisheries Co., whose topic was "Products from the Ocean"; Raphael Katzen, Northwood Lignin Fellow, Brooklyn Polytechnic Institute, who spoke on "Utilization of Wood Waste Products"; and John W. Robertson, chemical director, International Tailoring Co., whose speech was "Some Untouched Fields."

Dr. Harry L. Fisher, president of the Institute, was present to award the American Institute of Chemists medals to outstanding senior chemistry students in the universities and colleges in the vicinity of its local chapters. Awards were made to students from Brooklyn College, Brooklyn Polytechnic Institute, College of the City of New York, Columbia University, College of St. Elizabeth, Fordham University, Newark College of Engineering, New York University, Rutgers University and Queens College.

CANADIAN REVIEW

(*Continued from page 675*)

responding living costs in the United States. Wage rates have been stabilized accordingly and there have been no cost-of-living wage bonus paid to wage-earners since the new program was introduced.

One highly controversial feature of the Canadian price ceiling has been the payment of subsidies to permit merchants, manufacturers and producers to operate under the ceiling. Originally it was intended to pay subsidies only in respect of imported goods. Subsidies were to represent the cost of isolating Canada from the rest of the world. If coal prices rose in the United States it was realized at once that importers would have to be subsidized to permit them to continue to serve customers at the fixed Canadian ceiling price.

More recently it has been necessary to pay subsidies on a wide and increasing list of domestic goods where it has been found impossible to operate within the ceiling. Milk, shoes, groceries, leather, etc., are cases in point. The Prices Board argues that it is cheaper, sounder to pay these subsidies than permit prices to rise. But as yet it has not attempted, in respect of domestic subsidies to draw the line between essential and non-essential goods. Such a distinction will have to be made very soon, it is argued, even if it means puncturing the ceiling for luxury or non-essential goods.

At the moment Canadian business is engaged in a nation-wide simplification and standardization program inspired partly by the price ceiling and partly by the need for conservation of essential war materials. The aim is to curb wasteful competitive practices, conserve materials and manpower, and help business to cut costs so as to absorb the price "squeeze" and guard against the day when increasing shortages of raw materials and goods are going to cut volume and inflict a heavy "overhead" burden on many lines of business. It is this certainty of shortages in the coming months which will be the severest test of Canada's price ceiling now that the United States has removed the fear that Canada could not permanently freeze her prices alongside an inflationary United States price structure.

Patriotic Company

As a manifestation of their patriotism and pride in their company, employes of the Buffalo Electro-Chemical Company, Tonawanda, N. Y., presented a large American flag to President Charles A. Buerk who accepted it for the company in ceremonies April 23.

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1940 Average $1.20 - Jan. 1941 $1.16 - April 1942 $0.97

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Acetaldehyde, 99%, 55, 110 gal drs, wks ....lb.	...	.11	.11	.11	.11
Acetaldol (Aldol), 55, 110 gal drs, c-l, wks ....lb.	...	.12	.12	.11	.13
Acetamide, tech, kgs, wks .lb.	.28	.45	.28	.45	.28	.45
Acetanilid, tech, cryst, bbls ....lb.	.29	.31	.29	.31	.29	.31
powd, bbls ....lb.	.27	.29	.27	.29	.27	.29
Acetic Anhydride, drs, c-l, frt all'd ....lb.	.11½	.13	.11½	.13	.10½	.13
Acetin, tech, lcl drs ....lb.	...	.29	.29	.29	.29	.33
Acetone, tks, delv (*PC*) ..lb.	.07	.158	.07	.158	.06	.158
drs, c-l, delv (*PC*) ....lb.	.08½	.173	.08½	.173	.07½	.173
Acetonitrile, drs, wks ...lb.	1.00	2.00	1.00	2.00	1.00	2.00
Acetophenone, drs ....lb.	1.55	1.60	1.55	1.60	1.55	1.60
Acetophenetidin, bbls, kgs, 1000 lbs ....lb.	...	1.00	1.00	1.00	1.00	1.00
ACIDS						
Acetic, 28%, bbls (*PC*) 100 lbs.	3.38	3.63	3.38	3.63	2.23	3.43
glacial, nat, bbls ..100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
synth, drs ....100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
tks, wks ....100 lbs.	6.25	6.93	6.25	6.93	...	...
Acetylsalicylic, USP, (*PC*) special, 200 lb bbls ....lb.	...	.45	.45	.45	.45	.45
Standard USP ....lb.	...	.40	.40	.40	.40	.40
Adipic, fib drs, wks ....lb.	...	.31	.31	.31	.31	.31
Anthranilic, ref'd bbls ...lb.	1.20	1.25	1.20	1.25	1.15	1.20
tech, bbls ....lb.	...	.95	.95	.95	.75	.95
Ascorbic, bots, drs (*PC*) oz.	1.50	1.70	1.50	1.85	1.85	2.10
Battery, cbys, wks ..100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic, tech, bbls ....lb.	.43	.47	.43	.47	.43	.47
USP, bbls ....lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, frt all'd bgs 40 tons ....ton *a*	...	99.00	99.00	99.00	93.50	99.50
bbls ....ton *a*	...	109.00	108.00	109.00	108.00	108.00
Broenner's, bbls ....lb.	...	1.11	1.11	1.11	1.11	1.11
Butyric, c-l drs, wks ....lb.	...	.22	.22	.22	.22	.22
tks, wks ....lb.	...	.21	.21	.21	.21	.21
Caproic, drs, wks ....lb.	...	.35	.25	.35	.25	.30
Chlorosulfonic, drs, wks ..lb.	.03	.04½	.03	.04½	.03½	.05
tks, wks ....lb.	...	.02½	.02½	.02½	...	...
Chromic, drs (*FP*) ....lb.	.16¼	.18¼	.16¼	.18¼	.15¼	.17¼
Citric, crys, gran, bbls ..lb. *b*	.20	.21	.20	.21	.20	.21
Anhyd gran, drs (*PC*) lb.	.22½	.26½	.22½	.26½	.23	.26½
Cleve's bbls ....lb.	...	.65	.65	.65	.65	.65
Cresylic 50%, 210-215° HB, drs, wks, frt equal (A) gal.	.81	.86	.81	.86	.76	.84
Low Boiling ....gal.	.81	.86	.81	.86	.76	.84
Formic, tech, cbys ....lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls ....lb.	.27	.31	.27	.31	.24	.29
Gallic, tech, bbls ....lb.	1.10	1.12	1.10	1.13	.90	1.13
NF bbls ....lb.	1.27	1.30	1.27	1.30	1.10	1.30
H, bbls wks ....lb.	...	.45	.45	.45	.45	.45
Hydrochloric, see muriatic						
Hydrocyanic cyls, wks ...lb.	.80	1.00	.80	1.00	.80	1.00
Hydrofluoric, 30%, bbls, wks ....lb.	.06	.06½	.06	.06½	.06	.06½
Hydrofluosilic, 35%, bbls lb.	.09	.09½	.09	.09½	.09	.09½
Lactic, 22% dark, bbls ...lb.	.029	.0315	.029	.035	.02½	.035
22%, light, bbls wks ...lb.	.039	.0415	.039	.0415	.03½	.0415
44%, dark, bbls wks ...lb.	.063	.0655	.063	.0655	.05½	.0655
44%, light, bbls wks ...lb.	.073	.0755	.073	.0755	.06½	.073
Lauric, dist, tech, drs ....lb.	.20	.20½	.20	.20½	.15	.18¾
Laurent's bbls ....lb.	...	.45	.45	.45	.45	.45
Maleic, powd, drs ....lb.	...	.30	.30	.30	.30	.30
Anhydride, drs ....lb.	.25	.26	.25	.26	.25	.26
Malic, powd, kgs ....lb.	...	.47	.47	.47	.47	.47
Mixed, tks N unit ....lb.	.05	.06	.05	.06	.05	.06
S unit ....lb.	.0085	.009	.0085	.009	.0085	.009
Molybdic, kgs, wks ....lb.	.95	1.10	.95	1.10	.95	1.10
Monochloracetic, tech, bbls ....lb.	...	.17	.17	.17	.15	.18
Monosulfonic, bbls ....lb.	...	1.50	1.50	1.50	1.50	1.50
Muriatic, 18° cbys, c-l wks ....100 lb.	...	1.50	1.50	1.50	1.50	1.50
tks, wks ....100 lb.	...	1.05	1.05	1.05	1.05	1.05
20°cbys, c-l, wks ..100 lb.	...	1.75	1.75	1.75	1.75	1.75
tks, wks ....100 lb.	...	1.15	1.15	1.15	1.15	1.15
Acid (continued):						
22° cbys, c-l, wks ..100 lb.	...	2.25	2.25	2.25	2.25	2.25
tks, wks ....100 lb.	...	1.65	1.65	1.65	1.65	1.65
CP cbys ....lb.	.06½	.08	.06½	.08	.06½	.08
Myristic, dist, drs ....lb.	.19	.19½	.18	.19½	.18	.18½
Naphthenic drs, 220-230 ..lb.	...	.13	.10	.13	.10	.10
tks, wks ....lb.	...	.10	.09	.10	.09	.09
Naphthionic, tech, bbls ...lb.	.60	.65	.60	.65	.60	.65
Nicotinic cns ....lb.	...	6.96	6.96	7.15	7.15	7.15
Nitric, 36°, cbys, c-l, wks ....100 lbs. *c*	...	5.00	5.00	5.00	5.00	5.00
38°, c-l, cbys, wks 100 lbs. *c*	...	5.50	5.50	5.50	5.50	5.50
40°, c-l, cbys, wks 100 lbs. *c*	...	6.00	6.00	6.00	6.00	6.00
42°, c-l, cbys, wks 100 lbs. *c*	...	6.50	6.50	6.50	6.50	6.50
CP, cbys ....lb.	.11½	.13	.11½	.13	.11½	.13
Oxalic, bbls, wks (*PC*) ..lb.	.11¼	.12½	.11¼	.14½	.11½	.14¼
Phosphoric, 85% USP, cbys ....lb.	...	.12	.12	.12	.12	.12
50% food grade, c-l, bbls, wks, frt equal ..100 lbs.	4.00	4.25	4.00	4.25	4.00	4.25
Picramic, kgs ....lb.	.65	.70	.65	.70	.65	.70
Picric, bbls, wks ....lb.	...	.35	.35	.35	.35	.35
Propionic, pure, drs, wks lb.	...	.14	.14	.14	.14	.14
tks, wks ....lb.	...	.11	.11	.11	.11	.11
Pyrogallic, tech, lump, pwd, bbls ....lb.	...	1.45	1.45	1.45	1.45	1.45
USP, cryst, cns ....lb.	...	2.10	2.10	2.10	1.70	2.25
Pyroligneous, bbls, delv gal.	...	.25	.25	.25	.25	.25
Ricinoleic, tech, drs, wks lb.	.32	.37	.32	.37	.32	.37
Salicylic, tech, 125 lb bbls, wks (*PC*) ....lb.	...	.33	...	.33	...	.33
USP, bbls ....lb.	.35	.46	.35	.46	.35	.40
Sebasic, tech, bbls, wks ..lb.	...	.82	.82	.82	.82	.82
Stearic, see under Oils & Fats						
Succinic, bbls ....lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb drs, wks lb.	...	.17	...	.17	...	.17
Sulfuric, 60°, tks, wks ..ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks ....100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks ....ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks ....100 lb.	...	1.50	...	1.50	...	1.50
CP, cbys, wks ....lb.	.06½	.08	.06½	.08	.06½	.08
Fuming (Oleum) 20% tks, wks ....ton	...	19.50	...	19.50	18.50	19.50
Tannic, tech, 300 lb bbls ..lb.	.71	.73	.71	.73	.54	.73
Tartaric, USP, gran, powd, 300 lb bbls ....lb.	...	.70½	...	.70½	.46¼	.70½
Tobias, 250 lb bbls ....lb.	.55	.60	.55	.60	.55	.60
Trichloroacetic bottles ...lb.	2.00	2.50	2.00	2.50	2.00	2.50
Tungstic, pure, 100 lb pkg. lb.	...	2.86	...	2.86	no prices	
Acrylonitrile, tks ....lb.	...	.34	.34	.34	...	...
Albumen, light flake, 225 lb bbls ....lb.	.65	.75	.65	.75	.55	.75
dark, bbls ....lb.	...	.13½	.12½	.14	.13	.18
egg, edible ....lb.	1.73	1.78	1.73	1.85	.65	1.85
Alcohol, Amyl (from Pentane) tks, delv ....lb.	...	.131	...	.131	.111	.131
c-l, drs, delv ....lb.	...	.141	...	.141	.121	.141
lcl, drs, delv ....lb.	...	.151	...	.151	.131	.151
Amyl, normal lcl drs Wyandotte, Mich. ....lb.	...	.42	.27	.42	.25	.27
secondary, tks, delv ....lb. drs, c-l, delv E of Rockies ....lb.	...	.09½	...	.09½	...	.09½
tertiary, rfd, lcl, drs, f.o.b., Wyandotte, frt all'd ....lb.	...	.09	...	.09	...	.09
Benzyl, cans ....lb.	.65	.75	.65	.75	.65	.75
Butyl, normal, tks, f.o.b. wks, frt all'd (*PC*) ..lb.	.13½	.168	.12½	.168	.09	.158
c-l, drs, f.o.b. wks, frt all'd ....lb.	.14	.173	.13½	.173	.10	.168
Butyl, secondary, tks, delv ....lb.	...	.08½	...	.08½	.07¼	.08½
c-l, drs, delv ....lb.	...	.09½	...	.09½	.08¼	.09½
Butyl, tert denat c-l drs lb.	...	.12½	...	.12½	...	.12½
lcl drs ....lb.	...	.13	...	.13	...	.13
tks ....lb.	...	.11½	...	.11½	...	.11½
Capryl, drs, crude, wks lb.	...	.16	...	.16	...	.16
Cinnamic, bottles ....lb.	3.00	3.60	3.00	3.60	2.33	3.60
Denatured, CD, 14, c-l drs, wks (*PC, FP*) gal.	...	.65	...	.65	.36½	.45½
tks, East, wks ....gal.	...	.58	...	.58	.26½	.58
Denatured, SD, No. 1, tks,	...	.53	...	.53	.28½	.53

a Powdered boric acid $5 a ton higher; USP $25 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; *y* Price given is per gal.

(*A*) Allocations. (*FP*) Under full priority control. (*PC*) Under price ceiling.

c Yellow grades 25c per 100 lbs. less in each case. *d* Prices given are Eastern schedule; Territories other east of Rockies and 15½c per gal. less than Eastern Works price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

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ALUMINUM STEARATE
CALCIUM STEARATE

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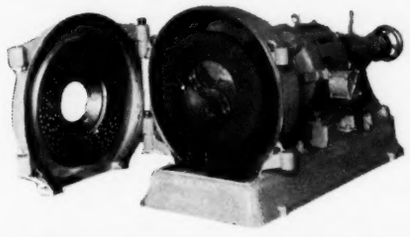

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Process Equipment Division
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		Current Market		1942 Low	1942 High	1941 Low	1941 High
Alcohols (continued):							
Diacetone, pure, c-l drs, delv	lb. *f*	.11½	.14½	.11½	.14½	.09½	.13
tks, delv	lb.	.10½	.13½	.10½	.13½	.10½	.13½
tech, contract, drs, c-l, delv	lb.	.11	.13½	.11	.13½	.09	.12
tks, delv	lb.	.10	.14	.10	.14	.10	.12½
Ethyl, 190 proof molasses, tks	gal. *g*	...	8.12	...	8.12	5.96½	8.12
c-l, drs	gal. *g*	...	8.19	...	8.19	6.02½	8.19
c-l, bbls	gal. *g*	...	8.25	...	8.25	6.03½	8.25
Furfuryl, tech, 500 lb. drs	lb.	.20	.25	.20	.25	.20	.25
Hexyl, secondary tks, delv	lb.	...	.23	...	.23	.12	.23
c-l, drs, delv	lb.	...	.24	...	.24	...	.13
Isoamyl, prim, cans, wks	lb.	...	.32	...	.32	...	.32
drs, lcl, delv	lb.	...	.22½	...	.22½	.22½	.27
Isobutyl, ref'd, lcl, drs	lb.	...	.086	...	.086	.079	.086
c-l, drs	lb.	...	.076	...	.076	.069	.076
tks	lb.	...	.076	...	.076	.069	.076
Ethylhexyl, tks, wks	lb.	.23	.23	.23	.23	.23	.23
Isopropyl, ref'd, 91% drs, frt all'd	gal.	.40½	.43½	.40½	.43½	.40½	.43½
tks, frt all'd	gal.	...	.34	.34	.34	.34	.34
99%, drs, frt all'd	gal.	.44	.47	.44	.47	.44	.47
tks, frt all'd	gal.	...	.37½	.37½	.37½	.37½	.37½
Octyl, see Ethylhexyl							
Polyvinyl A fib drs	lb.	...	.54	.54	.54	.26	.54
B fib drs	lb.	.65	.70	.65	.70	...	...
Propyl, nor, drs, wks	gal.	.69	.75	.69	.75	...	...
Spec Solvents, East, drs, wks	gal.	.67	.70	.67	.70	...	...
tks, East, wks	gal.	.61	.66	.61	.66	...	...
Tetrahydrofurfuryl drs, f.o.b. wks	lb.	.44	.50	.44	.50	...	...
Aldehyde ammonia, 100 gal drs	lb.	.65	.70	.65	.70	.65	.70
Aldehyde Bisulfite, bbls, delv	lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv	lb.	.12	.15	.12	.15	.11	.15
Alphanaphthol, crude, 300 lb bbls	lb.	...	.52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls	lb.	...	.32	...	.32	...	.32
Alum, ammonia, lump, c-l, bbls, wks	100 lb.	...	4.25	...	4.25	3.75	4.25
delv NY, Phila	100 lb.	...	4.25	...	4.25	3.75	4.25
Granular, c-l, bbls wks	100 lb.	...	4.00	...	4.00	3.50	4.00
Powd, c-l, bbls, wks	100 lb.	...	4.40	...	4.40	3.90	4.40
Potash, lump, c-l, bbls, wks	100 lb.	...	4.50	...	4.50	4.00	4.50
Granular, c-l, bbls, wks	100 lb.	...	4.25	...	4.25	3.75	4.25
Powd, c-l, bbls, wks	100 lb.	...	4.65	...	4.65	4.15	4.65
Soda, bbls, wks	100 lb.	...	3.25	...	3.25	...	3.25
Chrome, bbls	100 lb.	.12½	.15	.12½	.15	no prices	
Aluminum metal, c-l, (*FP*)	100 lb.	15.00	16.00	15.00	16.00	17.00	18.00
Acetate, 20%, nor sol, bbls	lb.	.10½	.11	.10½	.11	.10½	.11
Basic powd, bbls, delv	lb.	.40	.50	.40	.50	.35	.50
24% sol, bbls, delv	lb.	.10½	.11	.10½	.11	.09½	.12
Chloride anhyd 99% wks	lb.	.08	.12	.08	.12	.08	.12
Crystals, c-l, drs, wks	lb.	.06	.06½	.06	.06½	.06	.06½
Solution, drs, wks	lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv	lb.	.13	.15	.13	.15	.13	.15
Hydrate, 96%, light, 90 lb. bbls, delv	lb.	...	.14½	...	.14½	.12½	.14½
heavy, bbls, wks	lb.	...	.034	...	.034	.029	.03½
Oleate, drs	lb.	.22	.26	.17½	.26	.17½	.20
Palmitate, bbls	lb.	.25	.26	.25	.26	.20½	.26
Resinate, pp., bbls	lb.	...	.15	...	.15	...	.15
Stearate, 100 lb bbls	lb.	...	.23	...	.23	.18	.23
Sulfate, com, c-l, bgs, wks	100 lb.	1.15	1.25	1.15	1.25	1.15	1.25
c-l, bbls, wks	100 lb.	1.35	1.45	1.35	1.45	1.35	1.45
Sulfate, iron-free, c-l, bgs, wks	100 lb.	1.75	1.85	1.75	1.85	1.60	1.85
c-l, bbls, wks	100 lb.	1.95	2.05	1.95	2.05	1.80	2.10
Ammonia anhyd fert com, tks	lb.	.04½	.05	.04½	.05	.04½	.05
Ammonia anhyd, 100 lb cyl	lb.	...	.16	...	.16	...	.16
26°, 800 lb drs, delv	lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH_3 cont.		...	.08z	...	.08z	.04	.05¼
Ammonium Acetate, kgs	lb.	.27	.33	.27	.33	.27	.33
Bicarbonate, bbls, f.o.b. wks	100 lb.	.0564	.0614	.0564	.0614	.0564	.0614
Bifluoride, 300 lb bbls	lb.	.15½	.18	.15½	.18	.14	.18
Carbonate, tech, 500 lb bbls	lb.	.08¼	.09¼	.08¼	.09¼	.08¼	.09¼
Chloride, White, 100 lb. bbls, wks	100 lb.	4.45	...	4.45	...	4.45	...
Gray, 250 lb bbls, wks	100 lb.	5.50	5.75	5.50	5.75	5.50	5.75
Lactate, 500 lb bbls	lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls	lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls	lb.	...	.12	...	.12	...	.12
Nitrate, tech, bgs, bbls	lb.	.0435	.0455	.0435	.0455	.0435	.0455
Oleate, drs	lb.	...	.14	...	.14	...	.14
Oxalate, neut, cryst, powd, bbls	lb.	.23	.29	.23	.29	.19	.29
Perchlorate, kgs	lb.	.55	.65	.55	.65	.55	.65
Persulfate, 112 lb kgs	lb.	.21	.23	.21	.23	.21	.22

z On a f.o.b. wks. basis.

		Current Market		1942 Low	1942 High	1941 Low	1941 High
Ammonium (continued):							
Phosphate, diabasic tech, powd, 325 lb bbls	lb.	.07¼	...	.07¼	.09¼	.07¼	.09¼
Ricinoleate, bbls	lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls	lb.	...	.24½	...	.24½	...	.24½
Paste, bbls	lb.	...	.06½	...	.06½	...	.06½
Sulfate, dom, f.o.b., bulk	ton	29.00	30.00	29.00	30.00	29.00	30.00
Sulfocyanide, pure, kgs	lb.	.45	.55	.45	.55	.45	.65
Amyl Acetate (from pentane) tks, delv	lb.	...	.145	...	.145	.105	.145
c-l, drs, delv	lb.	...	.155	...	.155	.115	.155
lcl, drs, delv	lb.	...	.165	...	.165	.125	.165
tech drs, ex-fusel oil delv	lb.	...	.14½	...	.14½	...	.14½
Secondary, tks, delv	lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv	lb.	...	.09½	...	.09½	...	.09½
tks, delv	lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks	lb.	.56	.68	.56	.68	.56	.68
mixed l c l drs, wks	lb.	...	.08	...	.08	.0565	.08
tks, wks	lb.	...	.06	...	.06	.0465	.06
Amyl Ether (see Diamyl lcl, dms	lb.	...	.102	...	.102	...	...
cl, dms	lb.	...	.095	...	.095	...	...
tks	lb.	...	.085	...	.085	...	...
Mercaptan, drs, wks	lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs	lb.	...	.31	...	.31	.25	.31
Stearate, lcl, wks, drs	lb.	...	.32½	...	.32½	.26	.335
Amylene, drs, wks	lb.	.102	.11	.102	.11	.102	.11
tks, wks	lb.	...	.09	...	.09	...	.09
Amylnaphthalenes, see Mixed Amylnaphthalenes							
Aniline Oil, 960 lb drs and tks	lb.	...	.14½	...	.14½	...	.14½
Annatto fine	lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80-85%	lb.	...	.55	...	.55	...	.55
Anthraquinone, sublimed, 125 lb bbls	lb.	...	.70	...	.70	.65	.70
Antimony metal slabs, ton lots	lb.	.14½	...	.14	.14½	.14	.16½
Butter of, see Chloride							
Chloride, soln, cbys	lb.	...	.17	...	.17	...	.17
Needle, powd, bbls	lb.	.18½	.20	.18½	.20	.16	.18
Oxide, 500 lb bbls	lb.	.15	.16½	.15	.16½	.12	.16½
Salt, 63% to 65%, drs	lb.	...	.34	...	.34	.28	.34
Archil, conc, 600 lb bbls	lb.	...	.26	...	.26	no prices	
Aroclors, wks	lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls	lb.	.10¼	.10¾	.10¼	.10¾	.09½	.10¾
Arsenic, Metal	lb.	no prices		no prices		no prices	
Red, 224 lb cs kgs	lb.	no prices		no prices		no prices	
White, 112 lb kgs	lb.	.04	.04¼	.04	.04¼	.03½	.04¼
B							
Barium Carbonate precip, 200 lb bgs, wks	ton	55.00	65.00	55.00	65.00	45.00	65.00
Nat (witherite) 90% gr, c-l, wks, bgs	ton	...	43.00	...	43.00	...	43.00
Chlorate, 112 lb kgs, NY	lb.	...	.60	...	.60	...	.45
Chloride, 600 lb bbls, delv, zone 1	ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs	lb.	...	.10	...	.10	...	.10
Hydrate, 500 lb bbls	lb.	.06	.07	.06	.07	.05½	.07
Nitrate, bbls	lb.	.10½	.12½	.10½	.12½	.08½	.12½
Barytes, floated, 350 lb bbls c-l, wks	ton	...	27.65	...	27.65	25.15	27.65
Bauxite, bulk, mines	ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks	ton	...	16.00	...	16.00	...	16.00
200 mesh	ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks	lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, Ind, 8000 gal tks, ft all'd gal.		...	.15	...	.15	.14	.15
90% c-l, drs	gal.	...	.20	...	.20	.19	.20
Ind pure, tks, frt all'd gal.		...	.15	...	.15	.14	.15
Benzidine Base, dry, 250 lb. bbls	lb.	...	.70	...	.70	...	.70
Benzoyl Chloride, 500 lb drs	lb.	.23	.28	.23	.28	.23	.28
Benzyl Chloride, 95-97% rfd, drs	lb.	.22	.24	.22	.24	.19	.24
Beta-Naphthol, 250 lb bbls, wks	lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls	lb.	1.25	...	1.25	...	1.25	1.35
Tech, 200 lb bbls	lb.	...	.51	...	.51	.51	.52
Bismuth metal	lb.	...	1.25	...	1.25	...	1.25
Chloride, boxes	lb.	...	3.00	...	3.00	3.00	3.25
Hydroxide, boxes	lb.	3.35	3.46	3.35	3.46	3.35	3.46
Oxychloride, boxes	lb.	3.10	3.19	3.10	3.19	3.10	3.19
Subbenzoate, boxes	lb.	...	3.40	...	3.40	...	3.40
Subcarbonate, kgs	lb.	1.59	1.85	1.59	1.85	1.59	1.85
Subnitrate, fibre, drs	lb.	1.29	1.57	1.29	1.57	1.20	1.57
Trioxide, powd, boxes	lb.	...	3.65	...	3.65	...	3.65
Blanc Fixe, Pulp, 400 lb. bbls, wks	ton *h*	40.00	46.50	40.00	46.50	35.00	46.50
Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb.		2.25	3.10	2.25	3.10	2.00	3.10
lcl, drs, wks	lb.	2.50	3.35	2.50	3.35	2.25	3.35
Blood, dried, f.o.b., NY	unit	...	5.50	5.25	5.50	4.75	5.25
Chicago, high grade	unit	5.60	5.65	5.40	5.80	5.00	5.40
Imported shipt	unit	...	5.25	5.00	5.35	4.75	5.00
Blues, Bronze Chinese							
Prussian Soluble	lb.	...	.36	...	.36	.33	.36
Milori, bbls	lb.	...	.36	...	.36	.33	.36
Ultramarine,* dry, wks, bbls	lb.	...	.11	...	.11	...	.11
Regular grade, group 1	lb.	.16	.27	.16	.27	.16	.20
Pulp, Cobalt grade	lb.	.22	.24	.22	.24	.22	.24

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

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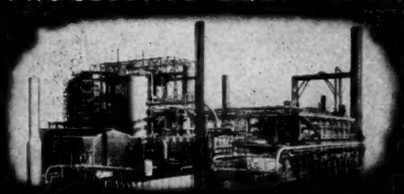

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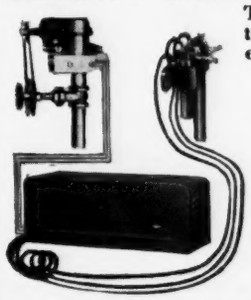

The Massco-Adams Density Controller, first used in ore classifiers, now has many applications in non-metallic and chemical plants—including potash and phosphate plants, washing coal, etc. Maintains *visual* control of density by motor-operated regulation of dilutant supply valve. Also available with standard chart recorder or with arm and weights for sink and float process. Widely optional location. *In writing, please describe your problem.*

The MINE AND SMELTER SUPPLY CO., Denver, Colo.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Bone, 4½ + 50% raw, Chicago ton	39.00	40.00	39.00	40.00	30.00	40.00
Bone Ash, 100 lb kgs lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50% imp ton	...	37.50	...	37.50	31.50	37.50
Domestic, bgs, Chicago ton	38.00	40.00	38.00	40.00	32.00	40.00
Borax, tech, gran, 80 and 40 ton lots, bgs, delv ..ton *i*	...	46.00	45.00	46.00	43.00	45.00
bbls, delv (*FP*) ton *i*	...	55.00	54.00	55.00	53.00	56.00
Tech, powd, 80 and 40 ton lots, bgs ton	...	51.00	50.00	51.00	48.00	50.00
bbls, delv ton	...	60.00	59.00	60.00	58.00	61.00
Bordeaux Mixture, drs lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases lb.	.25	.30	.25	.30	.25	.30
Bronze, Al, pwd, 300 lb drs (*FP*) lb.	...	.59	...	.59	...	.57
Gold, blk lb.	.60	.65	.60	.65	.60	.65
Butanes, com 16-32° group 3 tks lb.	...	.02½	...	.02½	.02½	.03
Butyl, acetate, norm drs, frt all'd lb.	.14½	.168	.14½	.168	.10	.168
tks, frt all'd lb.	.13½	.158	.13½	.158	.09	.158
Secondary, tks, frt all'd lb.	...	.08½	...	.08½	.07¼	.08½
drs, frt all'd lb.	...	.09½	...	.09½	.08¾	.09½
Aldehyde, 50 gal drs, wks lb.	.15½	.17½	.15½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)						
Chloride, normal lcl, drs lb.	...	.35	.28	.35	...	...
c-l, drs lb.	...	.32	.25	.32	...	...
Crotonate, norm, 55 and 110 gal drs, delv lb.	...	.35	...	.35	...	.35
Lactate lb.	...	.26½	...	.26½	...	.23½
Oleate, drs, frt all'd lb.	...	.25	...	.25	...	.25
Propionate, drs lb.	.16½	.17	.16½	.17	.16½	.17
tks, delv lb.	...	.15½	...	.15½	...	.15½
Stearate, 50 gal drs lb.	...	.31	...	.31	.28½	.32½
Tartrate, drs lb.	no prices		no prices		.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	.35½	...	.35½

C

Cadmium Metal lb.	.90	.95	.90	.95	.80	.95
Sulfide, orange, boxes lb.	...	1.10	...	1.10	...	1.10
Calcium, Acetate, 150 lb bgs c-l, delv 100 lb.	3.00	4.00	3.00	4.00	1.90	4.00
Arsenate, c-l, E of Rockies, dealers, drs lb.	.07	.08	.06½	.08	.06	.07½
Carbide, drs lb.	...	.04¾	...	.04¾	...	.04¾
Carbonate, tech, 100 lb bgs, c-l ton	16.00	20.00	16.00	20.00	16.00	20.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv ton	...	21.00	...	21.00	...	20.50
paper bgs, c-l, delv ton	18.50	41.00	18.50	41.00	18.50	35.00
Solid, 650 lb drs, c-l, delv ton	18.00	34.50	18.00	34.50	18.00	34.50
Ferrocyanide, 350 lb bbls wks lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb bbls lb.	.52	.59	.52	.59	.52	.59
Levulinate, less than 25 bbl lots, wks lo.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bgs ton	no prices		no prices		no prices	
Palmitate, bbls lb.	.28	.29	.28	.29	.22	.29
Phosphate, tribasic, tech, 450 lb bbls lb.	.0635	.0705	.0635	.0705	.0635	.0705
Resinate, precip, bbls lb.	.15	.16	.13	.16	.13	.14
Stearate, 100 lb bbls lb.	.26	.27	.26	.27	.20½	.27
Camphor, slabs lb.	1.60	1.65	1.60	1.65	.73	1.65
Powder lb.	1.60	1.65	1.60	1.65	.63	1.65
Carbon Bisulfide, 500 lb drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, f.o.b. plants lb.	...	.03625	...	.03625	.03325	.0342
Decolorizing, drs, c-l lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq, 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, (*FP*) (*PC*) 55 or 110 gal drs, c-l, delv lb.	...	.73	...	.73	.66½	.73
Casein, Standard, Dom, grd lb.	.21	.22	.21	.30½	.11½	.31
80-100 mesh,c-l bgs lb.	.21½	.22½	.21½	.31	.12	.31½
Castor Pomace, 5½ NH_3, c-l, bgs, wks ton	...	19.00	16.00	19.00	15.00	16.00
Imported, ship, bgs ton	no prices		no prices		no prices	
Celluloid, Scraps, ivory cs lb.	.13	.15	.13	.15	.12	.15
Transparent, cs lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, frt all'd, 50 lb kgs lb.	...	.30	...	.30	...	.30
Triacetate, flake, frt all'd lb.	...	.30	...	.30	...	.30
Chalk, dropped, 175 lb bbls lb.	...	.02⅞	...	.02⅞	.02¼	.02⅞
Precip, heavy, 560 lb cks 100 lbs.	...	32.50	32.50	32.50	32.50	32.50
Charcoal, Hardwood, lump, blk, wks bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* ..ton	25.00	36.00	25.00	36.00	25.00	36.00
Willow, powd, 100 lb bbls, wks lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified tks, wks lb.	...	.0225	...	.0225	.01¾	.0275
25%, bbls, wks lb.	...	.0275	...	.0275	.0240	.0275
China Clay, c-l, blk mines ton	...	7.60	...	7.60	...	7.60
Imported, lump, blk ...ton	19.00	24.00	18.60	24.00	18.60	...
Chlorine, cyls, lcl, wks, contract (*FP*) lb.	...	.07¼	...	.07¼	...	.07¼
cyls, c-l, contract ...lb. *j*	...	.05¼	...	.05¼	...	.05¼

j A delivered price; * Depends upon point of delivery.
(*FP*) Full Priority. (*PC*) Price Ceiling.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Chlorine (continued):					
Liq, tk, wks, contract 100 lb.	...	1.75	...	1.75	...	1.75
Multi, c-l, cyls, wks, cont lb.	...	2.00	...	2.00	1.90	2.00
Chloroacetophenone, tins, wks lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb. drs, lcl, wks lb.	...	.08	...	.08	.06	.08
Chloroform, tech, 650 lb drs lb.	...	.20	...	.20	...	.20
USP, 650 lb drs lb.	...	.30	...	.30	...	.30
Chloropicrin, comml cyls lb.	...	.80	...	.80	...	.80
Chrome, Green, CP lb.	.23	.33	.23	.33	.21	.25
Yellow lb.	.16	.17	.16	.17	.13½	.14½
Chromium Acetate, 8% Chrome, bbls lb.	.07¾	.08½	.07¾	.08½	.07¾	.08½
Fluoride, powd, 400 lb bbls lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls bbl.	7.50	7.75	7.50	7.75	7.50	7.75
Cobalt Acetate, bbls (A) lb.	...	.83¾	...	.83¾	.80½	.83¾
Carbonate tech, bbls (A) lb.	...	1.58	...	1.58	...	1.58
Hydrate, bbls (A) lb.	...	2.04	...	2.04	1.98	2.04
Linoleate, solid, bbls lb.	...	.42	...	.42	.33	.42
paste, 5%, drs lb.	...	.31	...	.31	...	.31
Oxide, black, bgs (A) lb.	...	1.84	...	1.84	...	1.84
Resinate, fused, bbls lb.	...	.13½	...	.13½	...	.13½
Precipitated, bbls lb.	...	.34	...	.34	...	.34
Cochineal, gray or bk bgs lb.	.37	.38	.37	.38	.37	.38
Teneriffe silver, bgs lb.	.38	.39	.38	.39	.38	.39
Copper, metal *FP*, *PC* 100 lb.	12.00	12.50	12.00	12.50	12.00	12.50
Acetate, normal, bbls, delv lb.	.24	.26	.24	.26	.22	.26
Carbonate, 52-54% 400 lb bbls lb.	.18	.20½	.18	.20½	.1650	.20½
Chloride, 250 lb bbls lb.	...	.20½	.19½	.20½	.16	.19½
Cyanide, 100 lb drs lb.	.34	.38	.34	.38	.34	.38
Oleate, precip, bbls lb.	...	.20	...	.20	...	.20
Oxide, black, bbls, wks lb.	.19½	.21	.19½	.21	.18	.21
red 100 lb bbls lb.	.20	.22	.20	.22	.19	.22
Sub-acetate verdigris, 400 lb bbls lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks, 100 lb.	5.15	5.50	5.15	5.50	4.75	5.50
Copperas crys and sugar bulk c-l, wks ton	...	17.00	...	17.00	14.00	17.00
Corn sugar, tanners, bbls 100 lb.	...	3.54	3.54	4.05	3.36	4.05
Corn Syrup, 42°, bbls 100 lb.	...	3.69	3.52	3.69	3.42	3.52
43°, bbls 100 lb.	...	3.74	3.57	3.74	3.47	3.57
Cotton, Soluble, wet 100 lb bbls lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls lb.	...	.57½	...	.57½	.38¼	.57½
Creosote, USP 42 lb cbys lb.	.60	.77	.60	.77	.45	.77
Oil, Grade 1 tks gal.	...	.15½	...	.15½	.13½	.15½
Grade 2 gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs, c-l lb.	.10¾	.11	.11	.11½	.09¾	.11¼
Crotonaldehyde, 97%, 55 and 110 gal drs, wks lb.	...	.15	...	.15	.11	.15
Cutch, Philippine, 100 lb bale lb	no supplies		...	.05¼	.04¾	.05¼
Cyanamid, pulv, bgs, c-l, frt all'd, nitrogen basis, unit	no prices		no prices		...	1.40

D

Derris root 5% rotenone, bbls lb.	...	.35	.40	.45	.21	.40
Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb.	...	4.00	...	4.00	3.80	4.00
British Gum, bgs ...100 lb.	...	4.25	...	4.25	4.05	4.25
Potato, Yellow, 220 lb bgs lb.	...	.09½	...	.09½	.08	.08½
White, 220 lb bgs, lcl lb.	.09½	.11¾	.09½	.11¾	.08½	.09
Tapioca, 200 bgs, lcl lb.	...	.0715	...	.0715	...	.0715
White, 140 lb bgs ..100 lb.	...	3.95	...	3.95	3.75	3.95
Diamylamine, c-l, drs, wks lb.	...	.61	.50	.61	.47	.50
lcl drs, wks lb.	...	.64	.53	.64	.48	.53
Diamylene, drs, wks lb.	...	.105	...	.105	.095	.105
lcl, drs lb.	...	.112	...	.112	...	...
tks, wks lb.	...	.09½	...	.09½	.08½	.09½
Diamylether lb.	...	...	...	...	.085	.102
lcl, drs lb.	...	.102	...	.102	...	...
c-l, drs lb.	...	.095	...	.095	...	...
tks lb.	...	.085	...	.085	...	...
Diamylnaphthalene, lcl, drs, f.o.b. wks lb.	...	.17	...	.17	.17	.20
Diamylphenol, lcl, drs lb.	...	.21	...	.21	...	...
Diamylphthalate, drs, wks lb.	...	.22	.21	.22	.21	.21½
Diamyl Sulfide, drs, lcl lb.	...	.25	...	.25	...	...
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate, drs, wks lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks lb.	...	.64	.53	.64	...	.53
c-l, drs, wks lb.	...	.61	.50	.61	...	.50
tks, wks lb.	...	.48	...	.48	...	.48
Dibutyl Ether, drs, wks, lcl lb.	.26	.28	.26	.28	.25	.28
Dibutylphthalate, drs, wks, frt all'd lb.	.21	.23	.21	.23	.19	.20
Dibutyltartrate, 50 gal drs lb.	...	.87	...	.87	.50	.87
Dichlorethylene, drs lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks lb.	.15	.16	.15	.16	.15	.16
tks, wks lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, c-l, drs lb.	...	.037	...	.037	.025	.04
lcl, drs lb.	...	.045	...	.045	...	...
tks, wks lb.	...	.03	...	.03	.0221	.025
Diethanolamine, tks ,wks lb.	...	.22½	...	.22½	...	.22½
Diethylamine, 300 lb drs, lcl, f.o.b., wks lb.	...	.81	.70	.81	...	.70

* These prices were on a delivered basis.

WILLIAM D. NEUBERG COMPANY

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Anhydrous Ammonia
Yellow Prussiate of Soda
Calcium Ferrocyanide
Calcium Chloride
Tri-Sodium Phosphate

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70 PINE STREET NEW YORK

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Standard Quality

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GOLWYNNE
CHEMICALS CORPORATION

420 LEXINGTON AVENUE • NEW YORK, N.Y.
PHONE LE2-9740

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Diethylamino Ethanol, lcl, drs, f.o.b. Wyandotte, frt all'd E. Miss ....lb.	...	.85	.75	.85	...	.75
Diethylaniline, 850 lb drs lb.	...	.40	...	.40	...	.40
Diethylcarbonate, com drs lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, c-l, drs ..lb.	...	.21½	...	.21½	.19	.20
Diethylsulfate, tech, drs, wks, lcl .....lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs ....lb.	.14	.15½	.14	.15½	.14	.15½
Mono ethyl ether, drs ..lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks .....lb.	...	.13½	...	.13½	...	.13½
Mono butyl ether, drs ..lb.	.22½	.24½	.22½	.24½	.22½	.24½
tks, wks .....lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks .....lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls ...lb.	...	.16	...	.16	...	.16
Oleate, bbls .....lb.	...	.17	...	.17	...	.17
Stearate, bbls .....lb.	...	.22	...	.22	...	.22
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis .....lb.	.85	.90	.85	.90	.85	1.05
Dimethylaniline, 240 lb drs lb.	.23	.24	.23	.24	.23	.24
Dimethyl phthalate, drs, wks, frt all'd .....lb.	...	.20	...	.20	.18½	.20
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, 400 lb bbls .....lb.	...	.14	...	.14	...	.14
Dinitronaphthalene, 350 lb bbls .....lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	...	.22	...	.22	...	.22
Dinitrotoluene, 300 lb bbls lb.	...	.18	...	.18	.15½	.18
Diphenyl, bbls .....lb.	...	.15	...	.15	.15	.20
Diphenylamine .....lb.	...	.25	...	.25	...	.25
Diphenylguanidine, 100 lb drs .....lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton	...	80.00	55.00	80.00	32.00	52.00
Extract .....lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
Drymet (see sodium metasilicate anhydrous).						
E						
Egg Yolk, dom., 200 lb. cases lb.	.87	.92	.87	1.05	.60	1.05
Epsom Salt, tech, 300 lb bbls c-l, NY .....100 lb.	...	1.90	...	1.90	...	1.90
USP, c-l, bbls .....100 lb.	...	2.10	...	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs .....lb.	.60	.61	.52	.61	.26	.53
Isopropyl 50 gal drs ...lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd .....lb.	...	.06	...	.06	...	.06
Nitrous cone bottles ...lb.	.93	1.10	.73	1.10	...	.73
Synthetic, wks, tks .....lb.	...	.10	.08	.10	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd .....lb.	.11	.12	.11	.12	.06½	.12
drs, frt all'd .....lb.	.12	.13	.12	.13	.07½	.13
99%, tks, frt all'd ...lb.	.11¼	.12¼	.11¼	.12¼	.06¾	.12¼
drs, frt all'd .....lb.	.12¼	.13¼	.12¼	.13¼	.07¾	.13¼
Acetoacetate, 110 gal drs lb.	...	.37½	...	.37½	.27½	.37½
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs .....lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd .....lb.	.50	.60	.50	.60	.45	.50
Chloride, 200 lb drs ....lb.	.18	.20	.18	.20	.18	.20
Chlorocarbonate, cbys ..lb.	...	.30	...	.30	...	.30
Crotonate, drs .....lb.	...	.35	...	.35	...	.35
Formate, drs, frt all'd ..lb.	...	.27¾	...	.27¾	.25	.27¾
Lactate, drs, wks .....lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks .....lb.	...	.33	...	.33	.25	.33
Silicate, drs, wks .....lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs .....lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont ....lb.	.75	.85	.75	.85	.75	.85
Anhydrous .....lb.	...	.75	...	.75	...	.75
Dichloride, (*FP*) 50 gal drs, E. Rockies .....lb.	...	.0742	...	.0742	.0693	.0746
Glycol, 50 gal drs, wks..lb.	.14½	.18½	.14½	.18½	.14½	.18½
tks, wks .....lb.	...	.13½	...	.13½	...	.13½
Mono Butyl Ether, drs, wks .....lb.	.16½	.17½	.16½	.17½	.16½	.17½
tks, wks .....lb.	...	.15½	...	.15½	...	.15½
Mono Ethyl Ether, drs wks .....lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks .....lb.	...	.13½	...	.13½	...	.13½
Mono Ethyl Ether Acetate, drs, wks .....lb.	.11½	.12½	.11½	.12½	.11½	.12½
tks, wks .....lb.	...	.10½	...	.10½	...	.10½
Mono Methyl Ether, drs wks .....lb.	.15½	.16½	.15½	.16½	.15½	.16½
tks, wks .....lb.	...	.14½	...	.14½	...	.14½
Oxide, cyl .....lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline .....lb.	.45	.47½	.45	.47½	.45	.47½
F						
Feldspar, blk pottery ....ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd. blk wks .....ton	14.00	17.50	14.00	17.50	14.00	17.50
Ferric Chloride, tech, crys, 475 lb bbls .....lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys .....lb.	.06½	.07	.06½	.07	.06½	.07

l + 10; *m* + 50; * Bbls. are 20c higher.
FP Full Priority. *PC* Price Ceiling.

Current

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Fish Scrap, dried, unground wks (*PC*) .....unit *l*	nominal	4.75	4.85	4.35	4.85
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis .....unit *m*	nominal	2.75	3.25	2.75	3.25
Fluorspar, 98% bgs ....ton	... 33.00	32.00	34.00	29.00	34.00
Formaldehyde, c-l, bbls, wks (*FP*, *PC*) .....lb.	.055 .0575	.055	.0575	...	...
Fossil Flour .....lb.	.02½ .04	.02½	.04	.02½	.04¼
Fullers Earth, blk, mines ton	8.50 15.00	8.50	15.00	8.50	15.00
Imp powd, c-l, bgs ....ton	30.00 40.00	30.00	40.00	no prices	
Furfural (tech) drs, wks lb.	... .15	...	.15	.10	.15
tks, wks .....lb.	... .09	...	.09	...	.09
Furfuramide (tech) 100 lb drs .....lb.	... .30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.18 .18½	.18	.18½	.16	.19½
Fustic, crystals, 100 lb boxes .....lb.	.28 .32	.28	.32	.24	.32
Liquid 50°, 600 lb bbls lb.	.12½ .16	.12½	.16	.10½	.16
Solid, 50 lb boxes .....lb.	.19 .21	.19	.21	.19	.21
G					
G Salt paste, 360 lb bbls ..lb.	... .45	...	.45	...	.45
Gambier, com 200 lb bgs lb.	no prices	...	.09½	.06½	.09½
Singapore cubes, 150 lb bgs .....100 lb.	.13 nom.	.12½	.13	.08¼	.11
Glauber's Salt, tech, c-l, bgs, wks .....100 lb.	1.05 1.28	1.05	1.28	.95	1.28
Anhydrous, see Sodium Sulfate					
Glue, bone, com grades, c-l bgs .....lb.	.15½ .18½	.15½	.18½	.13½	.18½
Better grades, c-l, bgs lb.	.19 .30	.19	.30	.15	.30
Glycerin (*PC*) CP, drs ...lb.	... .18¼	...	.18¼	.14½	.19½
Dynamite, 100 lb drs ...lb.	... .18¼	...	.18¼	...	.18¼
Saponification, drs .....lb.	... .12¾	...	.12¾	.09½	.20½
Soap Lye, drs .....lb.	... .11½	...	.11½	.07⅛	.18
Glyceryl Bori-Borate, bbls lb.	... .40	...	.40	...	.40
Monoricinoleate, bbls ...lb.	... .27	...	.27	...	.27
Monostearate, bbls .....lb.	... .30	...	.30	...	.30
Oleate, bbls .....lb.	... .22	...	.22	...	.22
Phthalate .....lb.	... .38	...	.38	...	.38
Glyceryl Stearate, bbls ...lb.	... .18	...	.18	...	.18
Glycol Bori-Borate, bbls ..lb.	... .22	...	.22	...	.22
Phthalate, drs .....lb.	... .38	...	.38	...	.38
Stearate, drs .....lb.	... .26	...	.26	...	.26
GUMS					
Gum Aloes, Barbadoes ...lb.	.80 .85	.80	.85	.80	.95
Arabic, amber sorts ....lb.	.22 .24	.22	.24	.14	.25
White sorts, No. 1, bgs lb.	.33 .35	.33	.35	.35	.45
Powd, bbls .....lb.	.26 .28	.26	.28	.18	.30
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY .....lb.	.04½ .05½	.04½	.05½	.04½	.05½
California, f.o.b. NY, drs ton	35.00 40.00	20.00	40.00	20.00	36.50
Egyptian, 200 lb cases, f.o.b. NY .....lb.	.12 .15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases .....lb.	.50 .55	.45	.55	.19	.50
Copal, Congo, 112 lb bgs, clean, opaque .....lb.	... .49½	...	.49½	...	.49½
Dark amber .....lb.	... .12¾	...	.12¾	...	.12¾
Light amber .....lb.	... .17	...	.17	...	.17
Copal, East India, 180 lb bgs					
Macassar pale bold ...lb.	... .17⅜	...	.17⅜	.12¾	.17⅜
Chips .....lb.	... .11½	...	.11½	.06¾	.11½
Dust .....lb.	... .07	...	.07	.05¼	.07
Nubs .....lb.	... .13⅜	...	.13⅜	.10½	.13⅜
Singapore, Bold .....lb.	... .22⅜	...	.22⅜	.15¾	.22⅜
Chips .....lb.	... .12⅜	...	.12⅜	.08½	.12⅜
Dust ... .lb.	... .07	...	.07	.05¼	.07
Nubs .....lb.	... .17¾	...	.17¾	.11	.17¾
Copal Manila, 180-190 lb	... .14	...	.14	.13⅜	.14
Loba B .....lb.	... .14¼	...	.14¼	.11¾	.14¼
Loba C .....lb.	... .13⅜	...	.13⅜	.11¼	.13⅜
DBB .....lb.	... .12¼	...	.12¼	.10	.12¼
MA sorts .....lb.	... .10¼	...	.10¼	.07¾	.10¼
Copal Pontianak, 224 lb cases, bold genuine ..lb.	... .22⅞	...	.22⅞	.15⅜	.22⅞
Chips .....lb.	... .14½	...	.14½	.10	.14½
Mixed .....lb.	... .17⅞	...	.17⅞	.14⅜	.17⅞
Nubs .....lb.	... .18⅞	...	.18⅞	.12¾	.18⅞
Split .....lb.	... .19⅝	...	.19⅝	.13¾	.19⅝
Damar Batavia, 136 lb cases					
A .....lb.	... .35¾	...	.35¾	.21⅝	.35¾
B .....lb.	... .34⅜	...	.34⅜	.20¼	.34⅜
C .....lb.	... .28⅝	...	.28⅝	.14⅜	.28⅝
D .....lb.	... .25⅝	...	.25⅝	.13¼	.25⅝
A/D .....lb.	... .28⅜	...	.28⅜	.15¼	.28⅜
A/E .....lb.	... .25⅝	...	.25⅝	.12⅞	.25⅝
E .....lb.	... .18¾	...	.18¾	.10	.18¾
F .....lb.	... .13¾	...	.13¾	.08	.13¾
Singapore, No. 1 .....lb.	... .30⅝	...	.30⅝	.16⅝	.30⅝
No. 2 .....lb.	... .25⅜	...	.25⅜	.12¼	.25⅜
No. 3 .....lb.	... .12⅜	...	.12⅜	.07⅞	.12⅜
Chips .....lb.	... .23½	...	.23½	.11	.23½
Dust .....lb.	... .13	...	.13	.07⅜	.13
Seeds .....lb.	... .17¾	...	.17¾	.09⅞	.17¾
Elemi, cns, c-l .....lb.	... .08⅞	...	.08⅞	.08½	.08⅞
Ester .....lb.	.08½ .09½	.08½	.09½	.06¼	.09½
Gamboge, pipe, cases ....lb.	2.30 2.35	.95	2.35	.95	1.00
Powd, bbls .....lb.	2.50 2.55	1.05	2.55	1.05	1.10
Ghatti, sol, bgs .....lb.	.11 .15	.11	.15	.11	.15
Karaya, bbls, bxs, drs ...lb.	.14 .33	.14	.33	.14	.33

FP Full Priority. *PC* Price Ceiling.

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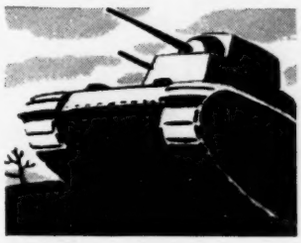

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ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK

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FRANKS CHEMICAL PRODUCTS CO.
BLDG. 9, BUSH TERMINAL — BROOKLYN, N.Y.

Kauri, NY
Logwood

Prices

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Kauri, N Y						
Brown XXX, cases	lb.	...	.60	...	.60	...	.60
BX	lb.	...	.38	...	.38	...	.38
B1	lb.	...	.28	...	.28	...	.28
B2	lb.	...	.24	...	.24	...	.24
B3	lb.	...	.18½	...	.18½	...	.18½
Pale XXX	lb.	...	.61	...	.61	...	.61
No. 1	lb.	...	.41	...	.41	...	.41
No. 2	lb.	...	.24	...	.24	...	.24
No. 3	lb.	...	.17¾	...	.17¾	...	.17¾
Kino, tins	lb.	no prices		no prices		no prices	
Mastic	lb.	3.25	3.30	3.25	3.30	1.50	3.30
Sandarac, prime quality, 200 lb bgs & 300 lb cks	lb.	1.00	1.10	1.00	1.10	.50	1.10
Senegal, picked bgs	lb.	...	.30	...	.30	...	.30
Sorts	lb.	...	.13	...	.13	...	.13
Thus, bbls	280 lbs.	...	16.50	...	16.50	15.00	16.50
Tragacanth, No. 1, cases	lb.	3.50	3.60	3.50	3.60	2.75	3.40
No. 2	lb.	2.00	3.00	2.00	3.00	2.45	2.80
No. 3	lb.	1.10	1.20	1.10	1.20	1.10	2.60
Yacca, bgs	lb.	.06½	.07¼	.06½	.07¼	.03½	.07¼
H							
Hematine crys, 400 lb bbls	lb.	.24	.34	.24	.34	.20	.34
Hemlock, 25%, 600 lb bbls wks	lb.	nom.	.03½	nom.	.03½	.03½	.03½
tks	lb.	nom.	.03	nom.	.03	.02¾	.03
Hexalene, 50 gal drs, wks	lb.	...	.23	...	.23	.23	.30
Hexane, normal 60-70° C. Group 3, tks (*PC*)	gal.	...	.11	...	.11	.09¾	.11
Hexamethylenetetramine, powd, drs (*FP*)	lb.	.32	.33	.32	.33	.32	.33
Hexyl Acetate, secondary, delv, drs	lb.	.13	.13½	.13	.13½	.13	.13½
tks	lb.	...	.12	...	.12		.12
Hoof Meal, f.o.b. Chicago unit		4.00	4.25	3.00	4.25	2.65	3.05
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb.	.16	.18½	.16	.18½	.16	.18½
Hydroxylamine Hydrochloride	lb.	...	3.15	...	3.15	...	3.15
Hypernic, Bags, No. 1	lb.	...	.42	...	.42	.40	.42
I							
Indigo, Bengal, bbls	lb.	2.14	2.20	2.14	2.20	1.63	2.20
Synthetic, liquid	lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars	lb.	...	2.00		2.00		2.00
Irish Moss, ord, bales	lb.	.30	.35	.30	.35	.25	.31
Bleached, prime, bales	lb.	.80	.85	.80	.85	.32	.46
Iron Acetate Liq. 17°, bbls delv	lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride							
Nitrate, coml, bbls	100 lb.	3.50	4.00	3.50	4.00	3.50	4.00
Isobutyl Carbinol (128-132°C) drs, frt all'd	lb.	...	.23½	...	.23½	.22½	.23½
tks, frt all'd	lb.	...	.21½	...	.21½	...	.21½
Isopropyl Acetate, tks, frt all'd	lb.	...	.10	.076	.10	.06½	.07½
drs, frt all'd, c-l	lb.	...	.12	.086	.12	.07½	.08½
Ether, see Ether, isopropyl							
K							
Keiselguhr, dom bags, c-l, Pacific Coast	ton	22.00	25.00	22.00	25.00	22.00	25.00
L							
Lead Acetate, f.o.b. NY, bbls, White, broken	lb.	.12¾	.13¼	.12	.13¼	.11	.12½
cryst, bbls	lb.	.12¾	.13¼	.12	.13¼	.11	.12½
gran, bbls	lb.	.13½	.14	.12¾	.13¼	.11¾	.13¼
powd, bbls	lb.	.13½	.14	.12¾	.13¼	.11¾	.13¼
Arsenate, East, drs	lb.	.11	.12	.11	.12	.09	.11
Linoleate, solid, bbls	lb.	...	.19	...	.19	...	.19
Metal, c-l, NY (*FP*) 100	lb.	5.85	5.90	5.85	5.90	5.70	5.90
Nitrate, 500 lb bbls, wks	lb.	.11	.14	.11	.14	.11	.14
Oleate, bbls	lb.	.18½	.20	.18½	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv	lb.	...	.09	...	.09	.08	.08¾
97% Pb_3O_4, delv	lb.	...	.09¼	...	.09¼	.084	.086
98% Pb_3O_4, delv	lb.	...	.09½	...	.09½	.0865	.0885
Resinate, fused, bbls	lb.	...	.09½	...	.09½	.09½	.16½
Stearate, bbls	lb.	...	.25	...	.25	...	.25
Titanate, bbls, c-l, f.o.b. wks, frt all'd	lb.	...	.10¼	...	.10¼	...	.10¼
White, 500 lb bbls, wks,	lb.	...	.07½	...	.07½	...	.07½
Basic sulfate, 500 lb bbls, wks	lb.	...	.07½	.06314	.07½	.06½	.07
Lecithin, ed, dms, cl	lb.	.28	...	...	...	...	...
tech, dms, cl	lb.	.34	...	...	...	...	...
Lime, chemical quicklime, f.o.b. wks, bulk	ton	7.00	13.00	7.00	13.00	7.00	13.00
Hydrated, f.o.b. wks	ton	8.50	16.00	8.50	16.00	8.50	16.00
Lime Salts, see Calcium Salts							
Lime, sulfur, dealers, tks	gal.	.07½	.08½	.07½	.08½	...	.07½
drs	gal.	.10	.14	.10	.14	.10	.14
Linseed Meal, bgs	ton	...	34.00	...	34.00	23.00	33.00
Litharge, coml, delv, bbls	lb.	...	.0790	...	.0790	.07	.0760
Lithopone, dom, ordinary, (*PC*). delv, bgs	lb.	...	.04¼	...	.04¼	.0385	.04¼
bbls	lb.	...	.04½	...	.04½	.041	.04½
Titanated, bgs	lb.	...	.056	...	.056	.05¼	.056
bbls	lb.	...	.0585	...	.0585	.05½	.0585
Logwood, 51°, 600 lb bbls	lb.	...	.13	...	.13	.10½	.13
Solid, 50 lb boxes	lb.	..	.22	...	.22	.16½	.22

(*FP*) Full Priority. (*PC*) Price Ceiling.

Current

Madder
Morpholine

		Current Market	1942 Low	1942 High	1941 Low	1941 High
M						
Madder, Dutch	lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbls	ton	74.00	80.00	74.00	80.00	65.00	80.00
Magnesium Carb, tech, 70 lb bgs, wks	lb.	...	.06¼	...	.06¼	...	.06¼
Chloride flake, 375 lb bbls, c-l, wks	ton	...	32.00	...	32.00	...	32.00
Metal Ingots, c-l	lb.	...	.27	...	.27	...	...
Oxide, calc tech, heavy bbls, frt all'd	lb.	...	.26	...	.26	...	.26
Light bbls above basis	lb.	...	.26	...	.26	...	.26
USP Heavy, bbls, above basis	lb.	...	.26	...	.26	...	.26
Palmitate, bbls	lb.	.33	.35	.33	.35	.33	.35
Silicofluoride, bbls	lb.	.20	.25	.20	.25	.11	.25
Stearate, bbls	lb.	.31	.33	.31	.33	.23	.31
Manganese, acetate, drs	lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls	lb.	.15	.16	.15	.16	.15	.16
Chloride, bbls	lb.	.14	nom.	.14	nom.	...	.14
Dioxide, tech (peroxide), paper bgs, c-l	ton	...	70.00	...	70.00	...	71.50
Hydrate, bbls	lb.	...	.82	...	.82	...	.82
Linoleate, liq. drs	lb.	.18	.19½	.18	.19½	.18	.19½
solid, precip, bbls	lb.	...	.19	...	.19	...	.19
Resinate, fused bbls	lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs	lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs	lb.	.10½	.11½	.10½	.11½	.10½	.11½
Mangrove, 55%, 400 lb bbls	lb.						
Bark, African	ton		no prices		no prices	34.00	38.00
Mannitol, pure cryst, cs, wks	lb.	...	.85	...	.85	.85	.90
commercial grd, 250 lb bbls	lb.	...	.40	...	.40	.35	.45
Marble Flour, blk	ton	12.50	14.50	12.50	14.50	12.00	14.50
Mercury chloride (Calomel)	lb.	...	2.95	...	2.95	2.70	2.95
Mercury metal ..76 lb. flasks		191.00	193.00	191.00	210.00	167.00	215.00
Mesityl Oxide, f.o.b. dest, tks	lb.	...	.10½	.	.10½	.10½	.15
drs, c-l	lb.	...	.12½	.11½	.12½	.11½	.16
drs, lcl	lb.	...	.13	.12	.13	.12	.16½
Meta-nitro-aniline	lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls	lb.	1.05	1.10	1.05	1.10	1.05	1.10
Meta-phenylene diamine 300 lb bbls	lb.	...	.65	...	.65	...	.65
Meta-toluene-diamine 300 lb bbls	lb.	...	.70	...	.70	.65	.70
Methanol, denat, grd. drs, c-l frt all'd (*PC*)	gal.	...	.66	...	.66	.60	.66
tks, frt all'd	gal.	...	.60	...	.60	...	.60
Pure, nat, drs, c-l, frt all'd	gal. *a*	.55½	.61½	.55½	.61½	.35½	.55½
tks, nat	gal. *a*	.50	.54½	.50	.54½	.30	.50
Synth, pure, drs	gal. *b*	.34½	.40½	.34½	.40½	...	...
tks, synth	gal. *b*	.28	.32½	.28	.32½	...	...
Methyl Acetate, tech tks, delv	lb.	.06	.07	.06	.07	.06	.07
55 gal drs, delv	lb.	.11	.12½	.11	.12½	.07	.12½
C.P. 97-99%, tks, delv	lb.	.09½	.10½	.09½	.10½	.09½	.10½
55 gal drs, delv	lb.	.10½	.13	.10½	.13	.10½	.13
Acetone, frt all'd, drs	gal. *p*	...	.81	...	.81	.37½	.81
tks, frt all'd	gal. *p*	...	.75	...	.75	.32	.75
Synthetic, frt, all'd, drs	gal. *p*	.51	.54½	.51	.54½	.37½	.51
tks, frt all'd	gal.	.43	.45½	.43	.45½	.32	.43
Anthraquinone	lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks	lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb. lots, frt all'd	lb.	.50	.55	.50	.55	...	.55
less than 100 lbs. f.o.b. wks	lb.	...	.60	...	.60	...	.60
Chloride, 90 lb. cyl	lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd	lb.	...	.08	...	.08	.06	.08
50 gal drs, frt all'd, c-l	lb.	...	.09½	...	.09½	.07	.09½
Formate, drs, frt all'd	lb.	...	.89	...	.89	...	.89
Hexyl, Ketone, pure, drs	lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd	lb.	...	.70	...	.70	.70	.80
Mica, dry grd, bgs, wks	ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs	lb.	...	2.50	...	2.50	...	2.50
Mixed Amylnaphthalenes mixed, ref., l-c-l, drs, f.o.b. wks	lb.	...	.16	...	.16	.16	.19
crude	lb.	...	.14	...	.14	.14	.15
Monoamylamine, c-l, drs, wks	lb.	...	.61	.50	.61	.50	.52
lcl, drs, wks	lb.	...	.64	...	.64	...	.55
Monoamylnaphthalene, l-c-l, drs, f.o.b. wks	lb.	...	.17	...	.17	.17	.20
Monobutylamine, drs c-l, wks	lb.	...	.48	.40	.48	...	.40
l-c-l, wks	lb.	...	.51	.51	.64	...	.48
Monochlorobenzene, see "C"							
Monoethanolamine, tks, wks	lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks	lb.	...	.46	...	.46	.35	.65
Monomethylamine, drs, frt all'd, E. Mississippi, c-l	lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs	lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, wks	lb.	...	.67	...	.67	...	.67

a Producers of natural methanol divided into two groups and prices vary for these two divisions; *b* Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones.

(*FP*) Full Priority. (*PC*) Price Control.

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EASTERN STEEL BARREL CORPORATION

BOUND BROOK NEW JERSEY

Myrobalans
Para Toluidine

Prices

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Myrobalans 25%, liq bbls lb.	no prices	no prices		no prices	
50% Solid, 50 lb boxes lb.	no prices	no prices		no prices	
J1 bgs ton	no prices	no prices		35.00	48.00
J2 bgs ton	no prices	no prices		28.00	39.00
N					
Naphtha, v.m.&p. (deodorized) see petroleum solvents.					
Naphtha, Solvent, water-white, tks gal.	...	.27	...	.27	...	.26
drs, c-l gal.	...	.31	...	.31	...	.31
Naphthalene, dom, crude bgs. wks lb.	2.50	2.75	2.50	2.75	2.25	2.75
Balls, flakes, pks lb.	...	.08	...	.08	.06¼	.08
Balls, ref'd bbls, wks lb.	...	.08	...	.08	.07	.08
Flakes, re'd, bbls, wks lb.	...	.08	...	.08	.07	.08
Nickel Carbonate, bbls lb.	.36	.36½	.36	.36½	.36	.36½
Chloride, bbls lb.	.18	.20	.18	.20	.18	.20
Metal ingot lb.	.35	.36	.35	.36	.34	.36
Oxide, 100 lb kgs, NY lb.	.35	.38	.35	.38	.35	.38
Salt, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, sulfate, 40%, drs, 55 lb drs lb.	...	.703	...	.703	...	.703
Nitre Cake, blk ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000 lb drs, wks lb.	.08	.09	.08	.09	.08	.09
tks lb.	...	.07	...	.07	...	.07
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.20	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
Nitrogenous Mat'l, bgs imp unit	no prices		no prices		no prices	
dom, Eastern wks unit	...	3.50	2.75	3.50	2.20	3.00
dom, Western wks unit	...	3.35	2.60	3.35	1.75	2.60
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs lb.	no prices		no prices		.26	.29
O						
Oak Bark Extract, 25%, bbls lb.	.03½ nom.		.03½	.03¾	.03⅛	.03¾
tks lb.	.02 nom.		...	.02	.02¾	.03
Octyl Acetate, tks, wks lb.	...	.15	...	.15	...	.15
Orange-Mineral, 1100 lb cks NY lb.	...	.12	...	.12	.11	.11½
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Ortho amyl phenol, l-c-l, drs, f.o.b. wks lb.	...	.25	...	.25	.15	.25
Orthoanisidine, 100 lb drs lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks lb.	.17	.17½	.17	.17½	.16	.17½
Orthodichlorobenzene, 1000 lb drs lb.	.06	.07½	.06	.07½	.06	.07½
Orthonitrochlorobenzene, 1200 lb drs, wks lb.	.15	.18	.15	.18	.15	.18
Orthonitroparachlorphenol, tins lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks lb.	...	.09	...	.09	...	.09
Orthotoluidine, 350 lb bbls, lcl lb.	...	.19	...	.19	...	.19
Osage Orange, cryst, bbls lb.	...	.23	...	.23	.21	.23
51° liquid lb.	...	.10	...	.10	...	.10
P						
Paraffin, rfd, 200 lb bgs (*PC*) 122-127° M P lb.	...	.052	...	.052	.04¼	.057
128-132° M P lb.	.056	.0585	.056	.0585	.057	.0595
133-137° M P lb.	.0615	.0640	.0615	.0640	.06¼	.06½
Para aldehyde, 99%, tech, 55-110 gal drs, wks lb.	...	.12	...	.12	.10	.12
Aminoacetanilid, 100 lb kgs lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs lb.	...	.32	...	.32	...	.32
Dichlorobenzine 200 lb drs, wks lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks (*FP*) lb.	.23	.24	.23	.24	.23	.24
Nitroacetanilid, 300 lb bbls lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks lb.	...	.45	...	.45	...	.45
Nitrochlorobenzene, 1200 lb drs, wks lb.	...	.15	...	.15	...	.15
Nitro-orthotoluidine, 300 lb bbls lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	...	.35	...	.35
Nitrosodimethylaniline, 120 lb bbls lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	...	.30
Pentaerythritol, tech, bbls, delv lb.	.33½	.35½	.33½	.35½	...	...
Phenylenediamine, 350 lb bbls lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb. bbls lb.	...	.70	...	.70	...	.70
tks, wks lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks lb.	...	.48	...	.48	...	.48

(*FP*) Full Priority. (*PC*) Price Control

Current

Paris Green
Potassium Perchlorate

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Paris Green, dealers, drs lb.	.24	.26	.24	.26	.23	.25
Pentane, normal, 28-38° C, group, 3 tks (*PC*) ..gal.	...	.08½	...	.08½	...	.08½
drs, group 3 .....gal.	.11½	.16	.11½	.16	.11½	.16
Perchlorethylene, 10 lb drs, frt all'd (*FP*) .....lb.	.08	.08½	.08	.08½	.08	.08½
Petrolatum, dark amber, bbls .....lb.	...	.03¾	...	.03¾	.02¾	.03½
White, lily, bbls .....lb.	...	.05¾	...	.05¾	.04¾	.05¾
White, snow, bbls .....lb.	...	.06½	...	.06½	.05½	.06½
Petroleum Ether, 30-60°, group 3, tks .....gal.	...	.16	...	.16	.13½	.16
drs, group 3 .....gal.	...	.18	...	.18	.14½	.18
PETROLEUM SOLVENTS AND DILUENTS						
Cleaners naphthas, group 3, tks, wks .....gal.	...	.07⅛	...	.07⅛	.07	.07⅛
East Coast, tks, wks gal.	...	.10½	...	.10½	.10	.10½
Lacquer diluents, tks East Coast .....gal.	...	.11	...	.11	.09½	.11
Group 3, tks .....gal.	.07⅜	.08⅛	.07⅜	.08⅛	.06¼	.08⅛
Naphtha, V.M.P., East tks, wks .....gal.	...	.10½	...	.10½	.09	.11
Group 3, tks, wks ...gal.	...	.07⅛	...	.07⅛	.06	.07⅛
Petroleum thinner, 43-47, East, tks, wks .....gal.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Group 3, tks, wks ...gal.	.06	.07	.06	.07	.05⅞	.07
Rubber Solvents, stand grd, East, tks, wks ..gal.	...	.10½	...	.10½	.09½	.10½
Group 3, tks, wks ...gal.	...	.07⅛	...	.07⅛	.06	.07⅛
Stoddard Solvents, East, tks, wks .....gal.	...	.09½	...	.09½	.083	.09½
Group 3, wks .....gal.	...	.06⅜	...	.06⅜	.05½	.06⅜
Phenol, 250-100 lb drs ....lb.	.12½	.13	.12½	.13	.12	.13¾
tks, wks (*FP*) .....lb.	.11½	.12	.11½	.12	.11	.12
Phenyl-Alpha-Naphthylamine, 100 lb kgs .....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs .....lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com .....lb.	...	1.75	...	1.75	...	1.50
Phloroglucinol, tech, tins ..lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons .....lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines 70% basis .....ton	...	2.70	2.40	2.70	2.15	2.40
72% basis .....ton	...	3.20	3.00	3.20	2.50	3.00
Florida Pebble, 68% basis ton	...	2.20	2.00	2.20	1.90	2.00
75-74% basis .....ton	...	4.00	...	4.00	...	2.90
Tennessee, 72% basis ..ton	...	5.00	...	5.00	4.50	5.00
Phosphorus Oxychloride 175 lb. cyl (*FP*) .....lb.	.15	.18	.15	.18	.15	.18
Red, 110 lb cases .....lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs .lb.	.38	.42	.38	.42	.38	.42
Trichloride, cyl .....lb.	.15	.16	.15	.16	.15	.16
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, 100 lb drs, wks .....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls Destructive dist .....lb.	...	.74	...	.74	.50	.65
Steam dist wat wh bbls gal.	...	1.10	...	1.10	.59	.68
Pitch Hardwood, wks ...ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbls, wks ....ton	19.00	22.00	19.00	22.00	19.00	22.00
Burgundy, dom, bbls, wks lb.	.06	.06½	.06	.06½	.06	.06½
Imported .....lb.	no prices		no prices		no prices	
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls .....bbl.	6.75	7.00	6.75	7.00	6.00	7.00
Polyamylnaphthalene, 1-c-l, drs, f.o.b. wks .....lb.	...	.25	...	.25	.25	.30
Potash, Caustic, wks, sol ..lb	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake .....lb.	...	.07	...	.07	...	.07
liquid, tks .....lb.	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, Dom 30% basis, blk .....unit	...	.60	...	.60	...	.60
POTASSIUM						
Potassium Abietate, bbls ..lb.	...	.08	...	.08	...	.08
Acetate, tech, bbls, delv lb.	...	.28	...	.28	.26	.28
Bicarbonate, USP, 320 lb bbls .....lb.	.19	.21	.14	.21	.14	.17
Bichromate Crystals, 725 lb csks *(*FP*) .....lb.	...	.09⅜	...	.09⅜	.08⅞	.09⅜
Binoxalate, 30 lb bbls ..lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs ...lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks .....lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾
liquid, tks .....lb.	...	.0275	...	.0275	...	.0275
drs, wks .....lb.	.03	.03⅛	.03	.03⅛	.03	.03⅛
Chlorate crys, 112 lb kgs, wks (*FP*) .....lb.	nom.	.11	nom.	.11	...	.11
gran, kgs .....lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs .....lb.	.09¾	.10	.09¾	.10	.09½	.10
Chloride, crys, bbls ....lb.	.08	nom.	.08	nom.	.04	.08
Chromate, kgs (*FP*) ...lb.	.24	.27	.24	.27	.24	.27
Cyanide, drs .....lb.	...	.55	...	.55	...	.55
Iodide, 250 lb bbls .....lb.	1.44	1.48	1.44	1.48	1.35	1.38
Metabisulfite, 300 lb bbls lb.	.18	.20	.18	.20	.18	.21
Muriate, bgs, dom, blk unit	.56	.58	.56	.58	.53½	.58
Oxalate, bbls .....lb.	.28	.30	.28	.30	.25	.30
Perchlorate, kgs, wks (*FP*) .....lb.	.09½	.11	.09½	.11	.09½	.11

* Spot price is ½c higher.
(*FP*) Full Priority. (*PC*) Price Control.

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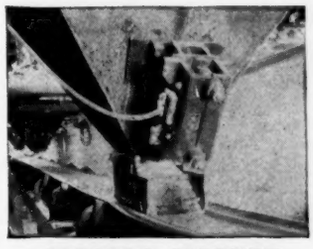

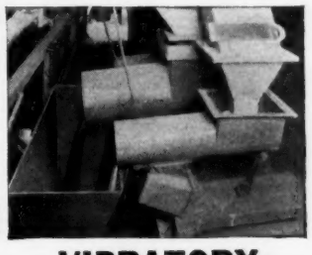

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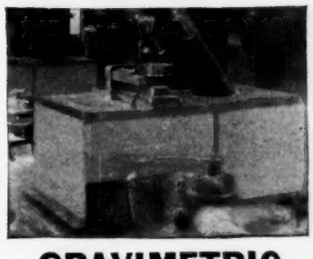
From lbs. to tons per hour by the twist of a Rheostat.



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Weigh Feed Material to a 99% Accuracy.

VIBRATING PACKERS
Increase the Net Contents of barrels, drums, etc.

Write for New 1942 Catalogue

SYNTRON CO.
420 Lexington Ave. Homer City, Pa.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Potassium (continued):					
Permanganate, USP, crys, 500 & 1000 lb drs, wks (*FP*) ....lb.	.20½ .21	.19¾	.21	.19¼	.21
Prussiate, red, bbls ....lb.	no prices	no prices		no prices	
Yellow, bbls ....lb.	.17 .19	.17	.19	.16	.19
Sulfate, 90% basis, bgs ton	... 36.25	...	36.25	...	36.25
Titanium Oxalate, 200 lb bbls ....lb.	... .45	...	.45	...	.40
Pot & Mag Sulfate, 48% basis bgs ....ton	... 26.00	...	26.00	26.00	27.00
Propane, group 3, tks (*PC*) lb.	... .03	...	.03	.03¾	.04
Putty, com'l, tubs ....100 lb.	... 3.15	...	3.15	...	3.15
Linseed Oil, kgs ....100 lb.	... 5.00	...	5.00	...	5.00
Pyrethrum, conc liq:					
2.4% pyrethrins, drs, frt all'd ....gal.	... 5.75	4.30	5.75	4.40	4.95
3.6% pyrethrins, drs, frt all'd ....gal.	... 8.53	6.35	8.53	6.60	7.20
Flowers, coarse, bgs ...lb.					
bgs ....lb.	.27 .28	.21	.28	.20	.25
Fine powd, bbls ....lb.	.28 .29	.22	.29	.21	.26
Pyridine, denat, 50 gal drs gal.	... 1.71	...	1.71	...	1.71
Refined, drs ....lb.	... .46	...	.46	...	.48
Pyrites, Spanish cif Atlantic ports, blk ....unit	no prices	no prices		no prices	
Pyrocatechin, CP, drs, tins lb.	2.15 2.40	2.15	2.40	2.15	2.40
Q					
Quebracho, 35% liq tks ..lb.	... .05¼	...	.05¼	.03¾	.05½
450 lb bbls, c-l ....lb.	... .05	...	.05	.04¼	.05
Solid, 63%, 100 lb bales cif ....lb.	... .04⅞	...	.04⅞	...	.04⅞
Clarified, 64% bales ..lb.	... .05	...	.05	.05	.05⅛
Quercitron, 41 deg liq, 450 lb bbls ....lb.	... .10	...	.10	.08½	.09½
Solid, drs ....lb.	... .18½	.18	.18½	.11	.16½
R					
R Salt, 250 lb bbls, wks ..lb.	... .55	...	.55	...	.55
Resorcinol, tech cans ....lb.	.68 .74	.68	.74	.68	.74
Rochelle Salt, cryst ....lb.	... .43½	...	.43½	.32½	.43½
Powd, bbls ....lb.	... .42½		.42½	.31½	.42½
Rosin Oil, bbls, first run gal.	... .51	.48	.51	.40	.50
Second run ....gal.	... .53	.50	.53	.42	.56
Third run, drs ....gal.	... .57	.54	.57	.46	.57
Rosins 600 lb bbls, 100 lb unit ex, yard NY:**					
B	... 3.03	3.03	3.66	2.06	3.55
D	... 3.29	3.29	3.65	2.08	3.55
E	... 3.40	3.40	3.74	2.07	3.62
F	... 3.46	3.46	3.79	2.08	3.59
G	... 3.55	3.55	3.79	2.18	3.52
H	... 3.55	3.55	3.79	2.27	3.50
I	... 3.57	3.57	3.79	2.26	3.50
K	... 3.67	3.67	3.88	2.36	3.61
M	... 3.76	3.76	3.94	2.38	3.68
N	... 3.82	3.82	4.05	2.47	3.71
WG	... 3.96	3.96	4.81	2.79	4.52
WW	... 4.11	4.11	5.20	3.05	4.57
X	... 4.11	4.11	5.20	3.10	4.57
Rosins, Gum, Savannah (280 lb. unit):**					
B	... 2.39	2.39	3.10	1.31	3.00
D	... 2.64	2.64	3.21	1.51	3.00
E	... 2.75	2.75	3.27	1.60	3.07
F	... 2.81	2.81	3.24	1.62	3.04
G	... 2.90	2.90	3.24	1.60	2.97
H	... 2.90	2.90	3.24	1.63	2.97
I	... 2.91	2.91	3.24	...	2.98
K	... 3.01	3.01	3.30	1.84	3.06
M	... 3.13	3.13	3.39	2.01	3.13
N	... 3.17	3.17	3.50	2.65	3.16
WG	... 3.31	3.31	4.26	2.76	3.97
WW	... 3.36	3.36	4.65	2.96	4.02
X	... 3.36	3.36	4.65	2.96	4.02
Rosin, Wood, c-l, FF grade, NY	1.70 2.00	1.70	2.00	1.40	2.00
Rotten Stone, bgs mines ton	25.50 37.50	25.50	37.50	25.50	37.50
Imported, lump, bbls ..lb.	no prices	no prices		no prices	
Powdered, bbls ....lb.	no prices	no prices		no prices	
S					
Sago Flour, 150 lb bgs ..lb.	.05 .05¾	.04¾	.05¾	.03½	.05½
Sal Soda, bbls wks ...100 lb.	... 1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks ....ton	... 15.00	...	15.00	13.00	17.00
Chrome, c-l, wks ....ton	... 16.00	...	16.00	...	16.00
Saltpetre, gran, 450-500 lb bbls ....lb.	... .082	...	.082	.076	.082
Cryst, bbls ....lb.	... .092	...	.092	.086	.092
Powd, bbls ....lb.	... .092	...	.092	.086	.092
Satin, White, pulp, 550 lb bbls ....lb.	.01¼ .01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs ....lb.	... .46	...	.46	...	.46

** Jan. 30. 1941, high and low based on 280 lb. unit.
r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y.. refined 6c higher in each case; (*FP*) Full Priority. (*PC*) Price Ceiling.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Shellac, Bone dry, bbls ..lb. s	.39 .40	.39	.40	.26	.40
Garnet, bgs ....lb.	.37 .39	.37	.39	.20	.39
Superfine, bgs ....lb. s	.32 .33	.32	.34	.16½	.34
T. N., bgs ....lb. s	.31 .32	.31	.33	.16	.33
Silver Nitrate, vials ....oz.	... .26⅞	...	.26⅞	.24	.26⅞
Slate Flour, bgs, wks ....ton	9.00 10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks ....100 lb.	... 1.15	...	1.15	...	1.15
58% light, bgs ....100 lb.	1.05 1.08	1.05	1.08	1.05	1.08
blk ....100 lb.	... .90	...	.90	...	.90
paper bgs ....100 lb.	1.05 1.08	1.05	1.08	1.05	1.08
bbls ....100 lb.	... 1.35	...	1.35	1.35	1.45
Caustic, 76% grnd & flake, drs ....100 lb.	... 2.70	...	2.70	...	2.70
76% solid, drs ....100 lb.	... 2.30	...	2.30	...	2.30
Liquid sellers, tks ..100 lb.	... 2.00	...	2.00	...	2.00
SODIUM					
Sodium Abietate, drs ....lb.	... .11	...	.11	...	.11
Acetate, 60% tech, gran. powd, flake, 450 lb bbls wks ....lb.	... .05	...	.05	.04	.06
90%, bbls 275 lb delv lb.	.06½ .07	.06½	.07	.06	.07
anhyd, drs, delv ....lb.	.08½ .10	.08½	.10	.08¼	.10
Alginate, drs ....lb.	.69 .73	.69	.73	.39	.73
Antimoniate, bbls ....lb.	.15 .15½	.15	.15½	.14	.15½
Arsenate, drs ....lb.	... .08	...	.08	.07	.08¾
Arsenite, liq, drs ....gal.	... .35	...	.35	...	.35
Dry, gray, drs, wks ..lb.	... .06¾	...	.06¾	.06½	.09¼
Benzoate, USP kgs ....lb.	.46 .50	.46	.50	.46	.50
Bicarb, powd, 400 lb bbl, wks ....100 lb.	... 1.70	...	1.70	...	1.70
Bichromate, 500 lb cks, wks* (*FP*) ....lb.	... .07⅜	...	.07⅜	.06⅞	.07½
Bisulfite, 500 lb bbls, wks lb.	.03 .031	.03	.031	.03	.031
35-40% sol bbls, wks 100 lb.	1.40 1.80	1.40	1.80	1.40	1.80
Chlorate, bgs, wks ....lb.	... .06¼	...	.06¼	...	.06¼
Cyanide, 96-98%, 100 & 250 lb drs, wks ....lb.	.14 .15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv ....lb.	.09½ .10½	.09½	.10½	.09	.10
Fluoride, white 90%, 300 lb bbls, wks ....lb.	... .08	...	.08	.07	.08
Hydrosulfite, 200 lb bbls, f.o.b. wks ....lb.	.17 .18	.17	.18	.17	.18
Hyposulfite, tech, pea crys 375 lb bbls, wks ..100 lb.	... 2.75	...	2.75	...	2.80
Tech, reg cryst, 375 lb bbls, wks ....100 lb.	... 2.45	...	2.45	...	2.45
Iodide, Jars ....lb.	... 2.42	...	2.42	...	2.42
Metanilate, 150 lb bbls ..lb.	... .40	...	.40	.41	nom.
Metasilicate, gran, c-l, wks ....100 lb.	... 2.50	...	2.50	2.35	2.50
cryst, drs, c-l, wks 100 lb.	... 3.05	...	3.05	...	3.05
Anhydrous, wks, c-l, drs ....100 lb.	... 4.00	...	4.00	3.75	4.00
wks, lcl, drs ....100 lb.	... 5.05	...	5.05	5.05	5.05
Monohydrated, bbls ....lb.	... .026	...	.026	.023	.026
Naphthenate, drs ....lb.	.12 .19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	... .50	...	.50	...	.50
Nitrate, 92% crude, 200 lb. bgs, c-l, NY ....ton	... 29.35	...	29.35	28.70	29.35
100 bgs, same basis ..ton	... 30.05	...	30.05	29.40	30.05
Bulk ....ton	... 27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls ....lb.	... .06¾	...	.06¾	.06¾	.11½
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25 .27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l anhyd. ....lb.	... .04¾	...	.04¾	.04½	.04¾
hyd, flake, 300 lb bbls, cl, f.o.b. wks ....lb.	.03 ...	...	...	.0285	.03
Perborate, drs, 400 lb ..lb.	... .14¾	...	.14¾	.14¾	.15¼
Peroxide, bbls, 400 lb ..lb.	... .17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	2.75 2.90	2.75	2.90	2.30	2.90
bgs, wks ....100 lb.	2.55 2.70	2.55	2.70	2.10	2.70
Tri-sodium, tech, 325 lb. bbls, wks ....100 lb.	2.90 3.05	2.90	3.05	2.45	3.05
bgs, wks ....100 lb.	2.70 2.85	2.70	2.85	2.25	2.85
Picramate, 160 lb kgs ..lb.	... .65	...	.65	...	.65
Prussiate, Yellow, 350 lb bbls, wks ....lb.	... .11	...	.11	.10½	.11
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	.0545 .0638	.0545	.0638	.0510	.0610
Sesquisilicate, drs, c-l, wks ....100 lb.	... 3.05	...	3.05	...	3.05
Silicate, 60°, 55 gal drs, wks ....100 lb.	... 1.70	...	1.70	...	1.70
40°, 55 gal drs, wks 100 lb.	... .80	...	.80	...	.80
tks, wks ....100 lb.	... .65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY ....lb.	.12 .15	.12	.15	.09¾	.15
Stannate, 100 lb drs ....lb.	.33½ .36½	.33½	.36½	.32½	.37
Stearate, bbls ....lb.	.19 .24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16 .18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks ....100 lb. t	1.70 1.90	1.70	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, c-l, wks ....lb.	... .024	...	.024	.02¼	.03
Solid, 650 lb drs, c-l, wks ....lb.	... .0315	...	.0315	.03	.03¼
Sulfite, powd, 400 lb bbls wks ....lb.	... .05¼	...	.05¼	...	.05¼
Sulfocyanide, drs ....lb.	.55 .65	.55	.65	.28	.65
Sulforicinoleate, bbls ....lb.	... .12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)					
Tungstate, tech, crys, kgs lb.	no prices	no prices		no prices	

s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. t Bags 15c lower; * Feb. 28. (*PC*) Price Control.

STANDARD

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SECONDARY BUTYL ALCOHOL
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WIN *YOUR* BATTLE OF PRODUCTION

• For heavy duty industrial metal cleaning in **steel plants** and **metal working plants** . . . chemical processing work in **paper** and **textile mills.**

Use a Cowles Silicate

★**DRYMET** (REG. U. S. PAT. OFF.) — **Anhydrous Sodium Metasilicate**
Drymet can be used alone or with other alkaline products, phosphates, soaps, etc., to give shorter cleaning time and better results. Drymet will give you free-flowing, non-caking detergents.

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Dryorth is a concentrated, trigger-action, high pH detergent silicate with excellent penetrating and wetting-out properties. It has speedy, dirt-loosening, prolonged suspending-emulsifying power.

★**CRYSTAMET** (REG. U. S. PAT. OFF.) — **Pentahydrate Sodium Metasilicate**
Crystamet is a pure, perfectly white, free-flowing granular product with the normal 42% water of crystallization. It can be used alone on medium pH jobs.

• **These silicates are sold at heavy chemical prices**

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Please quote prices on (Quantity)

☐ DRYMET _____ Drums (400 lbs. net)
☐ DRYORTH _____ Drums (400 lbs. net)
☐ CRYSTAMET _____ Bbls. (300 lbs. net)

Name _____
Company _____
Address _____

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Thanks for being patient when shipments are sometimes delayed. We know you understand how vital our products are to the VICTORY PROGRAM, and will bear with us while our country's needs are being served.

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CRUDE 99½% PURE

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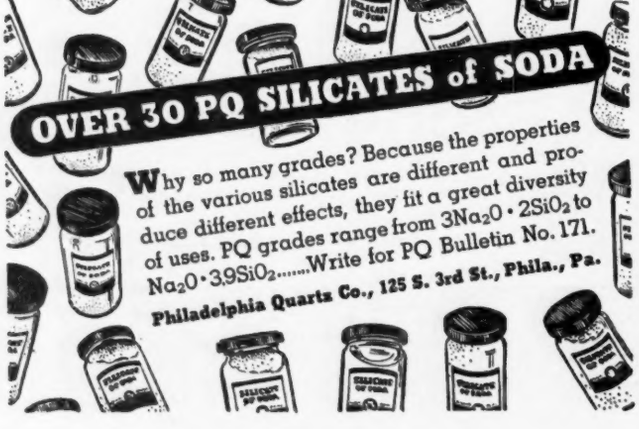
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Why so many grades? Because the properties of the various silicates are different and produce different effects, they fit a great diversity of uses. PQ grades range from $3Na_2O \cdot 2SiO_2$ to $Na_2O \cdot 3.9SiO_2$.....Write for PQ Bulletin No. 171.
Philadelphia Quartz Co., 125 S. 3rd St., Phila., Pa.

Sorbitol
Tributyl Citrate

Prices

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Sorbitol, drs, wks	lb.	...	.17¾	...	.17¾	.14¾	.17¾
Spruce, Extract, ord, tks	lb.	...	.01½	.01¼	.01½	.01⅜	.01¼
Ordinary, bbls	lb.	...	.02⅛	.01¾	.02⅛	.01⅜	.01¾
Super spruce ext, tks	lb.	...	.01½	...	.01½	.01⅜	.01½
Super spruce ext, bbls	lb.	...	.02	...	.02	.01⅞	.02
Super spruce ext, powd, bgs	lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs	100 lb.	...	3.10	...	3.10	2.90	3.10
Powd, 140 lb bgs	100 lb.	...	3.20	...	3.20	3.05	3.80
Potato, 200 lb bgs	lb.	...	.0610	...	.0610	.04½	.0585
Imp, bgs	lb.	no prices		no prices		no prices	
Rice, 200 lb bbls	lb.	.09	.10	.09	.10	.07½	.09½
Sweet Potato, 240 lb bbls, f.o.b. plant	100 lb.	nom.	7.00	nom.	7.00	nom.	7.00
Wheat, thick, bgs	lb.	...	.05	...	.05	...	.05
Strontium, carbonate, 600 lb bbls, wks	lb.	no prices		no prices		no prices	
Nitrate, 600 lb bbls, NY	lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
Sucrose, octa-acetate, den, grd, bbls, wks	lb.	...	.45	...	.45	...	.45
tech, bbls, wks	lb.	...	.40	...	.40	...	.40

SULFUR

Sulfur, crude, f.o.b. mines	ton	...	16.00	...	16.00	...	16.00
Flour, com'l, bgs	100 lb.	1.65	1.95	1.65	1.95	1.40	1.95
bbls	100 lb.	1.95	2.50	1.95	2.50	1.95	2.50
Rubbermakers, bgs	100 lb.	...	2.05	...	2.05	...	2.05
bbls	100 lb.	...	2.35	...	2.35	...	2.35
Extra fine, bgs	100 lb.	...	2.35	...	2.35	...	2.35
Superfine, bgs	100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls	100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs	100 lb.	3.05	3.35	3.05	3.35	2.80	3.35
bbls	100 lb.	3.40	3.70	3.40	3.70	3.15	3.70
Roll, bgs	100 lb.	2.40	2.70	2.40	2.70	2.15	2.70
bbls	100 lb.	2.30	2.85	2.30	2.85	2.30	2.85
Sulfur Chloride, 700 lb drs, wks	lb.	.03	.08	.03	.08	.03	.08
Sulfur Dioxide, 150 lb cyl	lb.	.07	.09	.07	.09	.07	.09
Multiple units, wks	lb.	.04½	.07	.04½	.07	.04½	.07
tks, wks	lb.	.04	.06	.04	.06	.04	.06
Refrigeration, cyl, wks	lb.	.16	.40	.16	.40	.16	.40
Multiple units, wks	lb.	.07½	.10	.07½	.10	.07½	.10
Sulfuryl Chloride	lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd	ton	no prices		no prices		no prices	
Extract, 42°, bbls	lb.	.08	.06¼	.08	.06¼	.06	.08
Superphosphate, 16% bulk, wks	ton	10.10	10.80	10.10	10.80	8.50	10.00
Run of pile	ton	9.60	10.20	9.60	10.20	8.00	9.60
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit	ton	...	.80	...	.80	.68	.80

T

Talc, Crude, 100 lb bgs, NY	ton	14.00	16.00	14.00	16.00	14.00	16.00
Ref'd 100 lb bgs, NY	ton	17.25	19.25	17.25	19.25	17.25	19.25
French, 220 lb bgs, NY	ton	no prices		no prices		no prices	
Ref'd, white bgs, NY	ton	no prices		no prices		no prices	
Italian, 220 lb bgs to arr	ton	no prices		no prices		no prices	
Ref'd, white bgs, NY	ton	no prices		no prices		no prices	
Tankage, Grd, NY	unit ‡	...	4.85	4.25	4.85	2.35	4.10
Ungrd	unit ‡	...	5.35	5.25	5.70	2.35	5.10
Fert grade, f.o.b. Chgo	unit ‡	...	5.60	5.60	5.90	2.35	5.60
South American cif	unit ‡	...	5.35	5.05	5.60	2.60	4.75
Tapioca Flour, high grade, bgs	lb.	.04	.07	.04½	.07	.03	.06¾
Tar Acid Oil, 15%, drs	gal.	...	.27½	...	.27½	.22	.24
25% drs	gal.	...	.31½	...	.31½	.25	.27½
Tar, pine, delv, drs	gal.	...	.33	.32½	.33	.26	.29
tks, delv, E. cities	gal.	...	.24	...	.24	...	.22
Tartar Emetic, tech, bbls	lb.	...	.47¾	...	.47¾	.36¾	.47¾
USP, bbls	lb.	.52¼	.53	.52¾	.53	.42	.53
Terpineol, den grade, drs	lb.	...	.17	...	.17	...	.17
Tetrachlorethane, 650 lb drs	lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech	lb.	.08	.09	.08	.09	.08	.09
Tetralene, 50 gal drs, wks	lb.	...	.19	...	.19	.19	.21
Thiocarbanilid, 170 lb bbls	lb.	...	.24	...	.24	...	.24
Tin, crystals 500 lb bbls, wks	lb	.39	.39½	.39	.39½	.38	.40
Metal, NY (*PC*)	lb.	...	.52	...	.52	.501	.52¾
Oxide, bbls, wks	lb.	.55	.57	.55	.57	.54	.56
Tetrachloride, 100 lb drs, wks	lb.	no prices		no prices		.25¼	.31
Titanium Dioxide, 300 lb bbls	lb.	...	.14½	...	.14½	.13¾	.14½
Barium Pigment, bbls	lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Calcium Pigment, bbls	lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
Titanium tetrachloride, drs, f.o.b. Niagara Falls	lb.	.32	.45	.32	.45	.32	.45
Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls	lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls	lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks	lb.	...	.26	...	.26	...	.26
Toluol, drs, wks (*FP*)	gal.	...	.33	...	.33	.32	.33
tks, frt all'd (*FP*)	gal.	...	.28	...	.28	.27	.28
Toner Lithol, red, bbls	lb.	.55	.60	.55	.60	.55	.60
Para, red, bbls	lb.	.70	.75	.70	.75	.70	.75
Toluidine, bgs	lb.	...	1.05	...	1.05	...	1.05
Triacetin, 50 gal drs, wks,	lb.	...	.26	...	.26	...	.26
Triamyl Borate, lcl, drs, wks,	lb.	...	.33	...	.33	.27	.33
Triamylamine, drs, lcl, wks, drs	lb.	...	1.01	...	1.01	...	1.01
Tributylamine, lcl, drs, f.o.b. wks	lb.	...	.81	...	.81	...	.81
Tributyl citrate, drs, frt all'd	lb.	...	.24	...	.24	.24	.26

(*FP*) Full Priority.

Current

Tributyl Phosphate
Zinc Chloride

		Current Market		1942 Low	1942 High	1941 Low	1941 High
Tributyl Phosphate, frt all'd	lb.	...	.47	...	.47	.42	.47
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts	lb.	(*FP*)	.08	...	.08	.08	.09
Tricresyl phosphate, tech, (*FP*)	lb.	...	.25	...	.25	.22	.36½
Triethanolamine, 50 gal drs, wks	lb.	...	.19	...	.19	...	.19
tks, wks	lb.	...	.18	...	.18	...	.18
Triethylamine, lcl, drs, f.o.b. wks	lb.	...	1.16	...	1.16	...	1.16
Triethylene glycol, drs, wks	lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls	lb.	...	.30	...	.30	...	.30
Stearate bbls	lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest.	lb.	...	.54	...	.54	.50	.54
Trimethylamine, c-l, drs, frt all'd E. Mississippi	lb.	...	.85	...	.85	.85	1.00
Triphenylguanidine	lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs (*FP*)	lb.	.31	.32	.31	.32	.33	.38
Tripoli, airfloated, bgs, wks	ton	21.00	26.00	21.00	26.00	21.00	26.00
Turpentine (Spirits), c-l, NY dock, bbls	gal.	...	.69¼	.69¼	.82½	.45	.83
Savannah, bbls	gal.	...	.55½	.55½	.70½	.33½	.72½
Wood Steam dist, drs, c-lcl, NY	gal.	.69	.72	.73	.80	.35	.76
tks, delv E. cities	gal.	...	.64	.68	.72	...	...
Wood, dest dist, cl-lcl, drs, delv E. cities	gal.	.65	.70	.65	.70	.35	.65
tks, delv E. cities	gal.	...	.58	...	.58	...	...

U

Urea, pure 112 lb cases	lb.	...	.12	...	.12	...	.12
Fert grade, bgs, c. i. f. S.A. points	ton	no prices		no prices		no prices	
Dom f.o.b., wks	ton	...	80.00	...	80.00	...	85.00
Urea Ammonia, liq., nitrogen basis	ton	...	121.58	...	121.58	...	121.58

V

Valonia beard, 42%, tannin bgs	ton	no prices		no prices		no prices	
Cups, 32% tannin bgs	ton	no prices		no prices		no prices	
Extract, powd, 63%	lb.	no prices		no prices		no prices	
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots	lb.	...	2.60	...	2.60	...	2.60
Ex-guaiacol	lb.	...	2.35	...	2.35	2.50	2.55
Ex-lignin	lb.	...	2.35	...	2.35	2.50	2.55
Vermilion, English, kgs	lb.	3.12	3.17	3.12	3.17	3.12	3.17

W

Wattle Bark, bgs	ton	41.00	43.00	41.00	43.00	37.50	43.00
Extract, 60°, tks, bbls	lb.	.046	.0475	.046	.0475	.03⅞	.05
Wax, Bayberry, bgs	lb.	.18	.20	.18	.20	.18	.20
Bees, bleached, white 500 lb slabs, cases	lb.	...	.61	.58	.61	.36½	.56
Yellow, African, bgs	lb.	...	.49	...	.49	.30	.47
Brazilian, bgs	lb.	...	.50	...	.50	.31	.50
Refined, 500 lb slabs, cases	lb.	.59	.60	.55	.60	.35	.52
Candelilla, bgs	lb.	...	.38	.33	.38	.19	.33
Carnauba, No. 1, yellow, bgs	lb.	.88	.89	.87	.89	.68	.88
No. 2, yellow, bgs	lb.	.87	.88	.86	.88	.66	.85
No. 2, N. C., bgs	lb.	.84	.85	.82	.85	.62	.79
No. 3, Chalky, bgs	lb.	.77	.78	.75	.78	.55	.78
No. 3, N. C., bgs	lb.	.78	.79	.77	.79	.58	.79
Ceresin, dom, bgs	lb.	.13½	.14	.13½	.14	.11	.14
Japan, 224 lb cases	lb.	.40	.45	.30	.45	.16½	.35
Montan, crude, bgs	lb.	.45	.46	.45	.46	.45	.46
Paraffin, see Paraffin Wax.							
Spermaceti, blocks, cases	lb.	.26	.27	.24	.27	.24	.25
Cakes, cases	lb.	.27	.28	.25	.28	.25	.26
Wood Flour, c-l, bgs	ton						
bgs, c-l, wks	ton	24.00	25.00	24.00	25.00	24.00	25.00
Whiting, chalk, com 200 lb		18.00	22.00	18.00	22.00	18.00	19.00
Gilders, bgs, c-l, wks	ton	20.00	24.00	16.00	24.00	16.00	20.00

X

Xylol, frt all'd, East 10° tks, wks	gal.	...	.27	...	.27	...	.29
Com'l tks, wks, frt all'd	gal.	...	.27	...	.27	.26	.27
Xylidine, mixed crude, drs	lb.	.35	.36	.35	.36	.35	.36

Z

Zein, bgs, 1000 lb lots, wks	lb.	...	.20	...	.20	...	.20
Zinc Acetate, tech, bbls, lcl, delv	lb.	.16	.17	.16	.17	.15	.16
Arsenite, bgs, frt all'd	lb.	...	.12	...	.12	...	.12
Carbonate tech, bbls, NY	lb.	.14	.20	.14	.20	.14	.20
Chloride fused, 600 lb drs, wks	lb.	...	.05	...	.05	...	.05
Gran, 500 lb drs, wks	lb.	...	.0575	...	.0575	...	.0575
Soln 50%, tks, wks 100 lb.		...	2.50	...	2.50	2.25	2.50

(*FP*) Full Priority. (*PC*) Price Control.

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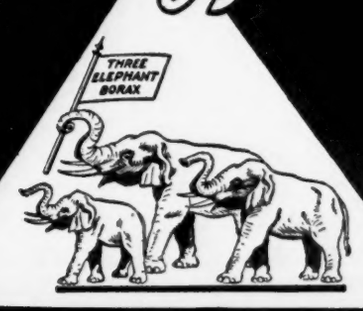

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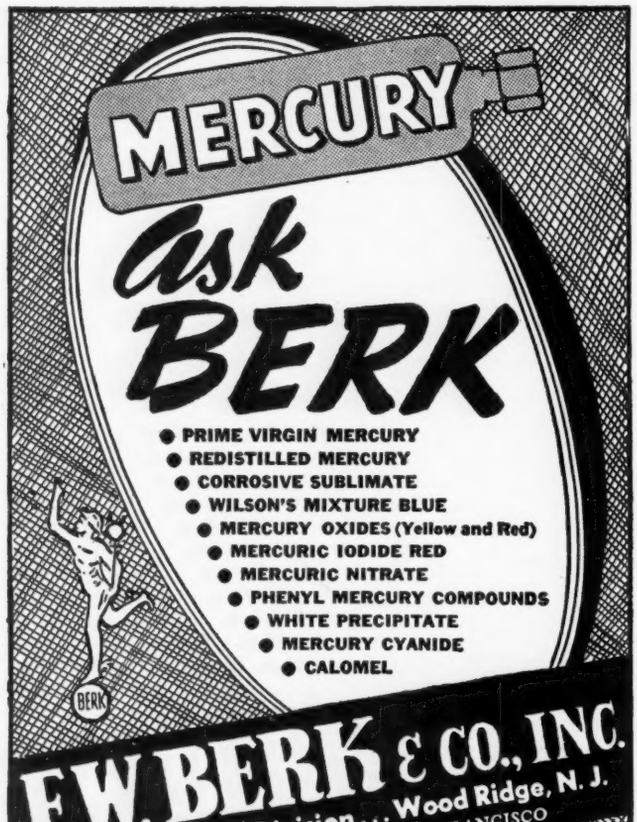

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FREEPORT SULPHUR COMPANY

122 East 42nd Street ● New York

Zinc Cyanide
Whale Oil

Prices Current

		Current Market		1942 Low	1942 High	1941 Low	1941 High
Zinc (continued)							
Cyanide, 100 lb drs	lb.	.33	.37	.33	.37	.33	.37
Dust, 500 lb bbls, c-l, delv	lb.	...	.1035	...	.1035	.09¼	.103
Metal, high grade slabs, c-l, NY (*FP*) (*PC*) 1000	lb.	...	8.65	...	8.65	7.65	8.64
E. St. Louis 100	lb.	...	8.25	...	8.25	7.25	8.25
Oxide, Amer, bgs, wks	lb.	...	.07¼	...	.07¼	.06½	.07¼
French 300 lb bbls, wks	lb.	...	.07¼	...	.07¼	.06¾	.07¼
Palmitate, bbls	lb.	.32	.33	.32	.33	.24½	.33
Resinate, fused, pale bbls	lb.	...	.10	...	.10	...	.10
Stearate, 50 lb bbls	lb.	.30	.31	.30	.31	.22	.31
Sulfate, crys, 40 lb bbls wks	lb.	...	.360	.360	.365	.315	.365
Flake, bbls	lb.	...	.410	.405	.410	.335	.405
Sulfide, 500 lb bbls, delv	lb.	...	.08½	.08	.08½	...	.08
bgs, delv	lb.	.14	.14¼	.14	.14¼	.08	.13¼
Sulfocarbolate, 100 lb kgs	lb.	.24	.29	.24	.29	.03⅜	.07¼
Zirconium Oxide, crude, 70-75% grd, bbls, wks	ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

Babassu, tks, futures	lb.	no prices		no prices			.06
Castor, No. 3, 400 lb drs	lb.	...	.13¾	.12½	.13¾	.0180	.12½
(*PC*) Blown, 400 lb drs	lb.	...	.15¼	.14	.15¼	.11¾	.14
China Wood, drs, spot NY	lb.	.40½ nom.		.40½ nom.		.27¼	.37¼
Tks, spot NY	lb.	.38¾ nom.		.38¾ nom.		.26¼	.35½
Coconut, edible, drs NY	lb.	no prices		no prices		.08	.15½
Manila, tks, NY	lb.	no prices		no prices		.03⅜	.10
Tks, Pacific Coast	lb.	no prices		no prices		....	.03¾
Cod, Newfoundland, 50 gal bbls	gal.	...	.85	...	.85	.07½	.80
Copra, bgs, NY	lb.	no prices		no prices		.0180	.04¼
Corn, crude, tks, mills	lb.	.12¾ nom.		.12½	.12¾	.06⅝	.13
Refd, 375 lb bbls, NY	lb.	.15½ nom.		...	.15½	.14¾	.16
Degras, American, 50 gal bbls, NY	lb.	.11½	.12⅛	.11½	.12⅛	.07½	.08¼
Greases, Yellow	lb.	...	.0929	...	.0929	.04¾	.08½
White, choice, bbls, NY	lb.	...	.097	...	.097	.05	.09
Lard, Oil, Edible, prime	lb.	...	.15½	...	.15½	.08½	.14½
Extra, bbls	lb.	...	.15¼	.15	.15¼	.08¼	.13¾
Extra, No. 1, bbls	lb.	...	.14⅝	.14½	.14⅝	.08	.13¼
Linseed, Raw less than 5 drs lots	lb.	...	.147	.125	.147	.091	.123
drs, c-l, spot	lb.	.139	.141	.117	.141	.095	.190
Tks	lb.	...	.13	.108	.13	.084	.1060
Menhaden, tks, Baltimore	gal.	nom.	.666	.63¾	.666	.30	.60
Refined, alkali, drs	lb.	.124	.1280	.12	.1280	.084	.122
Kettle boiled, drs	lb.	.134	.1380	.13	.1380	.096	.132
Light pressed, drs	lb.	.1140	.1180	.11	.1180	.082	.112
Tks	lb.	.106	.108	.102	.108	.072	.10
Neatsfoot, CT, 20°, bbls, NY	lb.	nom.	.25¾	...	.25¾	.18¼	.26½
Extra, bbls, NY	lb.	nom.	.14½	...	.14½	.08¼	.14
Pure, bbls, NY	lb.	nom.	.17¾	...	.17¾	.12¼	.17¾
Oiticica, bbls	lb.	.25¼ nom.		.25¼ nom.		16½	.23½
Oleo, No. 1, bbls, NY	lb.	...	.13¼	...	.13¼	.07⅜	.13¼
No. 2, bbls, NY	lb.	...	.13	...	.13	.07⅜	.13
Olive, denat, bbls, NY	gal.	4.40	nom.	4.00	4.50	2.25	4.25
Edible, bbls, NY	gal.	5.00	5.50	5.00	5.50	4.75	5.30
Foots, bbls, NY	lb.	.19½ nom.		.19	.20	.10¼	.19
Palm, Kernel, bulk	lb.	no prices		no prices		no prices	
Niger, cks	lb.	.09¼ nom.		.09¼ nom.		.04¼	.09
Sumatra, tks	lb.	no prices		no prices		.02	.09
Peanut, tks, f.o.b. mill	lb.	.13	nom.	.13	nom.	.05¼	.16
Refined, bbls, NY	lb.	.17	nom.	.16¾	.17	.08	.16
Perilla, drs, NY	lb.	...	.246	...	.246	.18	.23
Tks, Coast	lb.	...	.2380	...	.2380	.16½	.21½
Pine, see Pine Oil, Chem. Sec.							
Rapeseed, blown, bbls, NY	lb.	.18	.18½	.18	.18½	.16½	.18
Denatured, drs, NY	gal.	...	nom.	...	nom.	.95	1.00
Red, Distilled, drs	lb.	.133	.143	.12¾	.143	.07¼	.13
Tks	lb.	...	.1245	.12	.12½	.06¼	.11½
Sardine, Pac Coast, tks	gal.	.66½ nom.		.66½ nom.		.39	.62½
Refined alkali, drs	lb.	.124	.128	.12	.128	...	...
Light pressed, drs	lb.	.114	.118	.11	.118	.084	.122
Tks	lb.	.106	.108	.102	.108	.078	.112
Soy Bean, crude							
Dom, tks, f.o.b. mills	lb.	.12¼ nom.		.12¼ nom.		.05½	.12¾
Crude, drs, NY	lb.	.13	nom.	.13	nom.	.06¼	.12¼
Ref'd, drs, NY	lb.	.14¼ nom.		.14¼ nom.		.05½	.12¼
Tks	lb.	.13½ nom.		.13½ nom.		.07⅛	.13½
Sperm, 38° CT, bleached (*FP*) bbls, NY	lb.	.1301	...	.1301	nom.	.11	.127
45° CT, blchd, bbls, NY	lb.	.1278	...	.1278	nom.	.103	.12
Stearic Acid, double pressed dist bgs	lb.	.15	.16½	.15	.16½	.09½	.13¼
Double pressed saponified bgs	lb.	.15¼	.16¾	.15¼	.16¾	.09¾	.14
Triple pressed dist bgs	lb.	.18	.19½	.18	.19½	.12½	.16½
Stearine, Oleo, bbls	lb.	...	.11	...	.11	...	.09
Tall, crude, drs, c-l, wks	ton	...	55.00	40.00	55.00	...	...
tks, wks	ton	...	40.00	30.00	40.00	...	...
dist, drs, c-l, delv	lb.	...	.05	.04	.05	...	...
tks, wks	lb.	...	.04½	.03½	.04½	...	...
Tallow City, extra loose	lb.	...	.097¼	...	.097¼	...	.07¾
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A380. Luminescent Coatings. Report of Sub-Committee No. 43 of the New York Paint and Varnish Production Club. Describes luminescent paints and coatings from the standpoint of their known properties and uses at the present time, and to indicate their practical value and limitations. New York Paint and Varnish Production Club.

A381. Paint Progress; Vol. 3 No. 1. Contains among other items, articles on "Camouflage," "Substitute Coatings for Metallic Zinc on Steel," and "White Paint Improves Lighting and Increases Plant Efficiency." The New Jersey Zinc Co.

A382. Perbunan, Compounding and Processing. 36-page booklet containing extensive technical information on Perbunan, the oil-resistant member of the Buna rubber family Stanco Distributors.

A382. The Merck Institute for Therapeutic Research. Booklet describes the origin, organization and work of the Institute. The Merck Institute of Therapeutic Research.

A383. The Merck Report; April, 1942. 32-page booklet contains number of articles pertaining to medical and pharmaceutical subjects includes "In the Interests of Pharmacy and Medicine," "Plasma in Health and Its Value for Transfusions in Disease," "National Formulary War Emergency Changes," "Defense Manual for Pharmacists," "The Legal Responsibility of the Pharmacist," "Disorders of Sleep," "Medicine in the War." Merck & Co., Inc.

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E652. Dust Collectors; Catalog No. 82. Well illustrated catalog shows the mechanical features and specifications of the High Efficiency Cyclone Dust Collector and explains the construction and operating details. American Foundry Equipment Co.

E653. Facts about Rotary Pumps; Bulletin No. 301. 6-page illustrated folder describes line of rotary pumps and gives a rather clear explanation of the operating principle of swinging vane type rotary pumps. Blackmer Pump Co.

E654. Horizontal Pumps; Bulletin No. 270-A. 8-page illustrated bulletin, describing high pressure, motor driven, horizontal pumps and two-plunger steam pumps. The Watson-Stillman Co.

E655. Machine Maintenance With Metallizing. 16-page bulletin, 42A, describes the metallizing process and equipment for its application. Metallizing Engineering Co., Inc.

E656. Mixing and Storage Tanks; Bulletin 815. Describes new features on "junior series" glass lined mixing and storage tanks ranging in capacity from 5 to 100 gallons. The Pfaudler Co.

E657. Potentiometer Indicators; Bulletin No. A-305. Presents complete line of potentiometer temperature indicators and indicating resistance thermometers. Constructional features are shown and described. The Foxboro Co.

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E661. The Glass Lining; April-May, 1942. Contains following articles: "America's No. 1 Raw Material Problem" (rubber), "How to Obtain Greater Service from Your Present Dairy Equipment," "Food Will Win the War," and "Argentine Manufacturing Booms." The Pfaudler Co.

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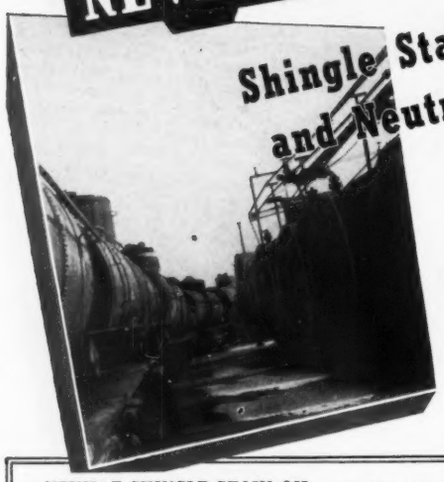

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Index to Advertisers

Albert & Son, L. 70
American British Chemical Supplies, Inc. 68
American Cyanamid & Chemical Corp. ..... 584 and 58
American Flange & Mfg. Co. 62
American Hard Rubber Co. ..... 590 and 59
American Potash & Chemical Corp. 69
Badger & Sons Co., E. B. 68
Baker Chemical Co., J. T. 58
Barrett Division, The, Allied Chemical & Dye Corp. 69
Beacon, Co., The 69
Berk & Company, F. W. 70
Blaw-Knox Division of Blaw-Knox Co. 58
Bower Chemical Mfg. Co., Henry 68
Brill Equipment Corp. 70
Buffalo Foundry & Machine Co. ..... Insert facing 59
Burke, Edw. S. 67
Carbide & Carbon Chemicals Corp. 61
Church & Dwight, Inc. 68
Claflin, Alan 70
Clark Bros. Co. Inc. ..... Insert between 594 and 59
Commercial Solvents Corp. ..... Insert between 594 and 59
Continental Can Co. 60
Consolidated Products Co. Inc. 70
Cowles Detergent Company, The 69
C. P. Chemical Solvents, Inc. 70
Crown Can Company 65
Darco Corp. 59
Diamond Alkali Co. 63
Doe & Ingalls, Inc. 70
Dow Chemical Co. 65
Dunkel & Co., Inc., Paul 70
Eastern Steel Barrel Corp. 69
Enthone Company, The 69
Equitable Paper Bag Co. 67
Fairmount Chemical Co. 70
Fergusson Co., Alex C. 70
Franks Chemical Products Co. 69
Freeport Sulphur Co. 70
General Ceramics Co. 60
General Chemical Co. ..... Cover 3
Golwynne Chemicals Corporation 69
Gray & Co., William S. 68
Greeff & Co., R. W. 67
Harshaw Chemical Co., The 70
Heekin Can Company 70
Heyden Chemical Corp. 59
Hinde & Dauch Paper Co. 65
Industrial Chemical Sales, Division West Virginia Pulp & Paper Co. 60
Jefferson Lake Sulphur Co., Inc. 69
Johnson & Son, Inc., S. C. 69
Jones & Laughlin Steel Corp. 70
King & Co., Inc., E. & F. 70
Knight, Maurice A. 68
Koppers Company 59
LaPine & Company, Arthur S. 70
Loeb Equipment Supply Co. 70
Machinery & Equipment Corp. 70
Mann & Co., Inc., Geo. 70
Marine Magnesium Products Corp. 68
Mathieson Alkali Works, Inc. 58
Merck & Co. 59
Michigan Alkali Co. 58
Mine & Smelting Supply Co., The 68
Molnar Laboratories 70
Monsanto Chemical Co. ..... Cover 1
Morgan & Co., Clarence 70
Mutual Chemical Co. of America, Inc. 58
National Aniline Division, Allied Chemical & Dye Corp. 66
National Carbon Company, Inc. 60
Natural Products Refining Co. 60
Neuberg Company, William D. ..... 689 and 70
Neville Company, The 70
Niacet Chemicals Corp. 69
Niagara Alkali Company ..... Insert facing pages 586 and 587

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Index to Advertisers

Oldbury Electro-Chemical Co. 687
Pacific Coast Borax Co. 705
Pennsylvania Coal Products Co. 694
Pennsylvania Salt Manufacturing Co. 603
Peters Chemical Mfg. Co. 702
Pfaltz & Bauer, Inc. 697
Pfizer & Co., Inc., Chas. 594
Philadelphia Quartz Co. 698
Pick & Co., Inc., Albert 679
Pittsburgh Plate Glass Company, Columbia Chemical Division 631
Polachek, Z. H. 702
Prior Chemical Corp. 660
Quaker Oats Co., The 601
Reilly Tar & Chemical Corporation 704
Robinson Mfg. Co. 679
Rosenthal Co., H. H. 693
Saranac Machine Company 677
Sharples Chemicals, Inc. (formerly the Sharples Solvents Corp.) 663
Schuylkill Chemical Co. 705
Sherwood Refining Co., Inc. 693
Singer, T. E. R. 701
Singmaster & Breyer 703
Snell, Inc., Foster D. 701
Solvay Sales Corp. ..... Cover 2
South Florida Test Service 701
Sparkler Mfg. Co. 695
Sprout, Waldron & Company Inc. 685
Standard Alcohol Company 697
Standard Silicate Division, Diamond Alkali Co. 592
Starkweather Co., J. U. 702
Stauffer Chemical Co. 606
Stroock & Wittenberg Corp. ..... Insert between 594 and 595
Syntron Co. 695
Tennessee Corp. 698
Texas Gulf Sulphur Co. 689
Tidewater Oil & Machinery Corp. 703
Titanium Alloy Manufacturing Company 671
Turner & Co., Joseph 685
Union Carbide & Carbon Corp. ..... 600 and 611
U. S. Industrial Chemicals, Inc. ..... Insert facing pages 682 and 683
U. S. Potash Company 687
U. S. Stoneware Corp. 685
Victor Chemical Works 633
Virginia Carolina Chemical Corp. ..... Insert between 594 and 595
Warner Chemical Co., Westvaco Chlorine Products Corp. 579
Weiss & Downs, Inc. 701
Wilson & Bennett Mfg. Co. 666
Wishnick-Tumpeer, Inc. ..... Cover 4

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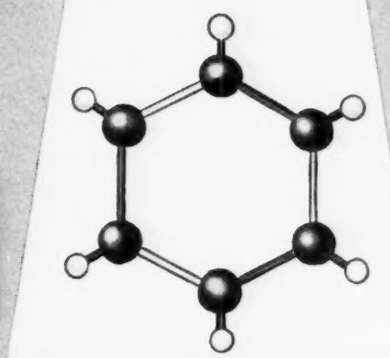

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Readers of "C. I." will, we feel sure, find the new monthly feature "The Canadian Background" by Kenneth R. Wilson specially valuable. The latest addition to the group of feature writers on Chemical Industries, each a recognized authority in his respective field, is the chief Ottawa correspondent of the MacLean Publishing Company, publishers of the Financial Post, MacLean's Magazine and numerous newspapers, national magazines, and industrial business publications.

A graduate of Victoria College, Toronto, he has been a member of the MacLean organization since 1925, during most of that period being an associate editor of The Financial Post.

He has traveled widely and has an intimate knowledge of Canadian business affairs. He has gained a widespread reputation for the accuracy and thorough grasp of business problems shown in his writings.

When the price "ceiling" was established in Canada last October Mr. Wilson was temporarily loaned by his company to the Wartime Prices and Trade Board for special publicity work.

Our deepest sympathy goes out to "Bill" George in the loss of his brother, General Harold H. George, one of the heroes of Bataan and a specially valuable aid to General MacArthur. We feel a personal loss, too, for it was our good fortune to have known him for many years. The country has suffered an irreparable loss for he was one of the outstanding officers of the Army Air Corps. His skill and outstanding leadership will be sadly missed.

Our apologies to C. V. Douglas in stating on one of the "roto" pages last month that he was associated with the George Chemical Co. "Doug", of course, should have been properly identified as Diamond Alkali.

The Grandfather's Follies company was a distinct added attraction to the train carrying New York A. C. S. members to the recent Memphis meeting. There seems to be quite a difference of opinion, however, as to who is to receive proper credit.

Priorities
Allocations
Price Controls

See the Statistical and Technical Data Section (Part 2 of this issue) for monthly digest of Government Regulations of Materials and Prices. Invaluable to you in your work.

The Federation of Architects, Engineers, Chemists and Technicians, C. I. O., in a recent publicity release issues a solemn "warning" that over 75 per cent of the Nation's chemists were being wasted for the war effort. Very interesting if true, but production schedules indicate something quite different. And a little farther along in this interesting document is the following: "What the FAECT wants is an All-American team of labor and management to answer the insidious tie-up of some American companies with the Nazi I. G. Farbenindustrie as shown by the case of Standard Oil in the matter of synthetic rubber." Quite a neat little "me too" gesture don't you think?

Since the Defense Savings Program was launched in May 1941, events of far-reaching importance have occurred. To preserve our very existence we have been compelled to wage war upon far-flung battle lines. To maintain these lines, the President has said that during 1942 we must produce over 60,000 planes; 45,000 tanks; 20,000 anti-aircraft guns; 8,000,000 tons of shipping; in addition to mobilizing, training and equipping millions of fighting men. Upwards of 50 per cent of our total productive capacty and an equal share of our national income must be diverted to making war materials. This has meant a tremendous increase in the magnitude of the financial problem facing the Government. Reliable estimates indicate that during the next fiscal year, that is from July 1, 1942 to June 30, 1943, we shall spend in the neighborhood of 60 billion dollars. Not all of us can actually bear arms in this fight—but each and every man woman and child can belong to the financial army. Buy bonds or stamps regularly. The Secretary of the Treasury suggests as a total or quota for those administering the payroll savings plan, that at least ten per cent of gross payroll be set aside by employees for the purchase of United States Savings Bonds.

That check for $6,112.72 to the Red Cross from the proceeds of the annual dinner of the Drug, Chemical and Allied Trades Section of the New York Board of Trade calls for congratulations to the chairman of the Section, S. Barkesdale Penick, Jr., and to all those who assisted.

It is indeed a pleasant sight to see two of our consulting editorial board members, Dr. Walter S. Landis and Dr. R. C. Downs again feeling "fit as a fiddle."

Fifteen Years Ago

From Our Files of May, 1927

A. L. Lobenberg is elected a vice-president of National Aniline.

Monsanto officials deny rumor of merger with Dow Chemical.

W. Hepburn Chamberlain resigns from Hooker Electrochemical.

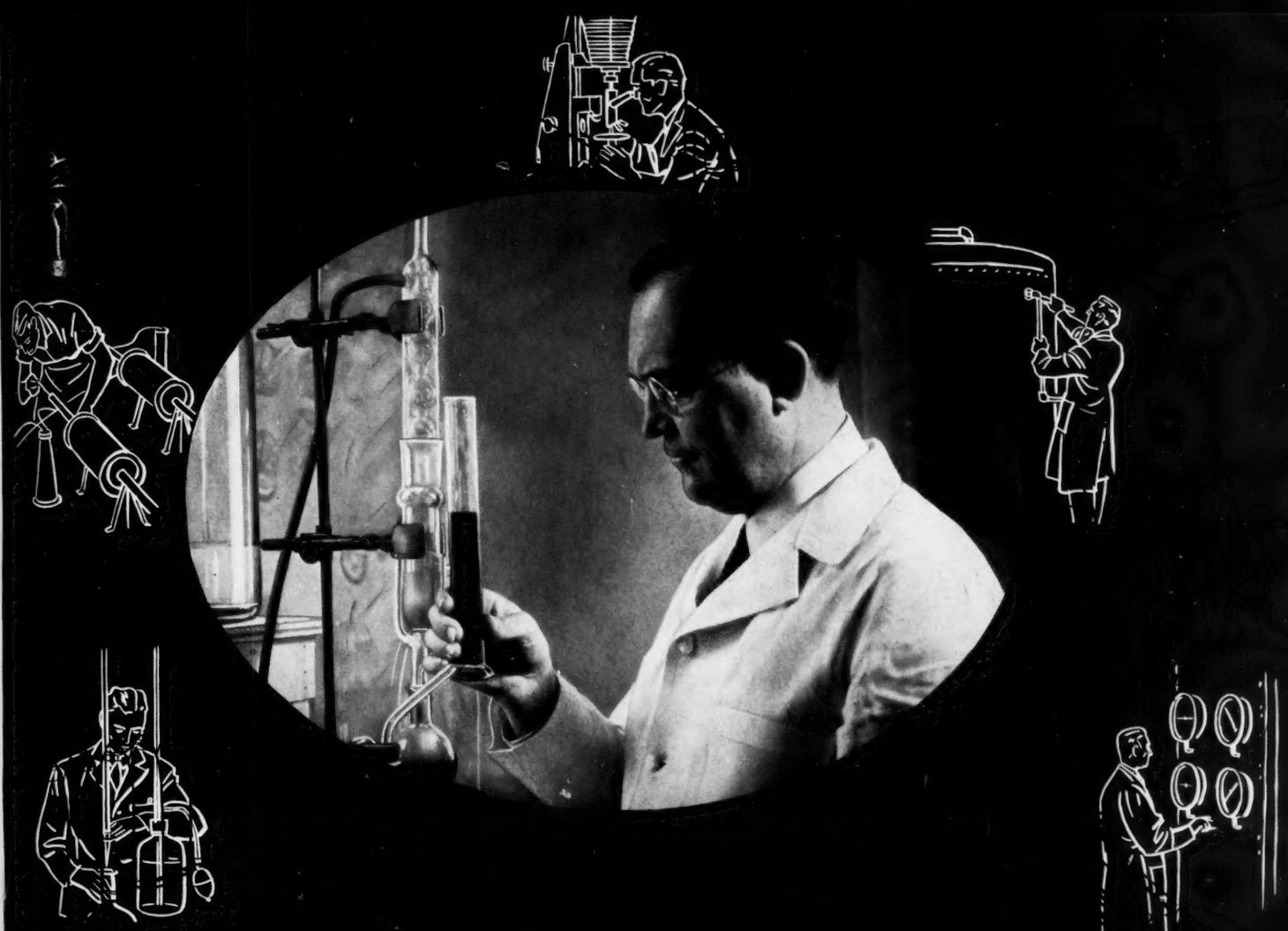
Wishnick-Tumpeer announces purchase of Pioneer Asphalt plant at Lawrenceville, Ind.

Herbert R. Prior of Grasselli Chemical joins the firm of H. B. Prior Co.

Merck and Powers-Weightman-Rosengarten in $9,000,000 merger.

J. A. Singmaster and F. G. Breyer, both of N. J. Zinc, form a consulting firm.

Du Pont acquires American patent rights to the Casale ammonia process.



KEY MEN in the Production Army!

While our armed forces are fighting the war at the front, chemists and chemical engineers are in the same fight on another front—*that of war production!*

Theirs is the responsibility of controlling the quality of countless items of war material . . . theirs is the task of increasing this output through chemistry. And because of their training, we can look to them to develop superior raw materials which will play their part in contributing to the ultimate victory.

Here at General Chemical Company, our chemists are directly serving the war effort in many ways. They are stepping up by multiples the production of those products for which war industries have developed an insatiable appetite. They are seeking and finding substitutes for chemicals now scarce . . . are putting past research into the development of new and useful chemicals . . . adding them to an ever-growing list of standard products . . .

. . . *All of which is essential* to the strengthening of America at war.

GENERAL CHEMICAL COMPANY
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GENERAL CHEMICAL COMPANY
40 RECTOR STREET, NEW YORK, N. Y.

Sales Offices: Atlanta • Baltimore • Boston • Bridgeport (Conn.) • Buffalo • Charlotte (N. C.) • Chicago
Cleveland • Denver • Detroit • Houston • Kansas City • Milwaukee • Minneapolis • New York
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Pacific Coast Sales Offices: San Francisco • Los Angeles
Pacific Northwest Sales Offices: Wenatchee (Wash.) • Yakima (Wash.)
In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

These 3 New Witco Developments

ARE RELIEVING RAW MATERIAL SHORTAGES IN MANY PLANTS

PERHAPS WE CAN HELP YOU TOO!

Witco Yellow, a replacement for French Ochre; Witco Blancal, an alternate for Blanc Fixe; Witcarb, an improved calcium carbonate—these three new products of Wishnick-Tumpeer research are not only relieving current raw material shortages in many applications, but are finding a permanent place in manufacturing techniques. For these products are not merely "substitutes" born of an emergency; they are definitely superior in many respects to the materials they replace.

These three developments offer convincing demonstrations of the skill and resourcefulness of Wishnick-Tumpeer's staff in dealing with raw material problems. The Research Laboratories of Wishnick-Tumpeer are thoroughly equipped to undertake such problems, particularly in the fields of chemicals, oil, pigments, asphalts, and allied products.

If you are faced with a shortage of raw materials essential to your production—or if new manufacturing conditions require modification in the properties of other materials—perhaps you, too, can benefit by Wishnick-Tumpeer's technical cooperation. Write, wire, or phone us an outline of your problem—what materials you need, what properties they must have, how they are to be used. Let our experienced research workers assist you in the effort to develop alternate or improved materials that may provide a satisfactory solution to your problem.

WITCO YELLOW

A new synthetic pigment, Witco Yellow offers interesting possibilities for replacing French Ochres in rubber and paint manufacture. While practically the same in analysis as French Ochre, it provides these outstanding advantages:

Greater strength
Higher tinctorial value
Cleaner final tint

WITCO BLANCAL

This precipitated barium-calcium compound is available in both low and high oil grades as an alternate to Blanc Fixe. In most cases, it gives better results than Blanc Fixe, since it offers you these desirable characteristics:

Extremely fine division
Excellent color, in dry state
as well as under oil
Higher bulking value

WITCARB

This new inert offers special advantages as a white reinforcing filler in rubber formulas requiring high tensile and modulus. In paint formulas, it provides such features as:

Lower cost per pigment pound
More gallons per pound
Added texture in flats
Better stability in finished product
Improvements in Lithopone and
Titanated Lithopone paints, and in
some cases gloss paints and enamels

Samples and complete information on any of these new products will be sent on request.

WISHNICK-TUMPEER, INC.

MANUFACTURERS AND EXPORTERS

New York, 295 Madison Avenue • Boston, 141 Milk Street • Chicago, Tribune Tower
Cleveland, 616 St. Clair Avenue, N.E. • Witco Affiliates: Witco Oil & Gas Company
The Pioneer Asphalt Co. • Panhandle Carbon Co. • Foreign Office, London, England

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State of Chemical Trade

Current Statistics (April 30, 1942)—p. 103

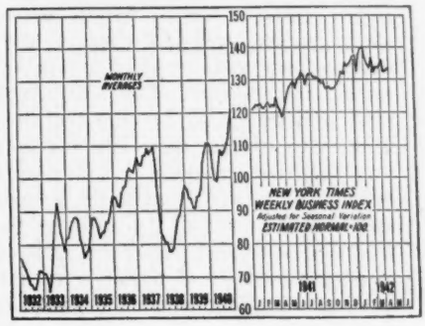
WEEKLY STATISTICS OF BUSINESS

Week Ending	Carloadings 1941	Carloadings 1940	Carloadings % of Change	Electrical Output* 1941	Electrical Output* 1940	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Chem. & Drugs	Fertilizer Fats & Oils	Ass'n Price Indices Fert. Mat.	Price Indices Mixed Fert.	Price Indices All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
Apr. 4	828,890	683,402	+21.3	3,348,608	2,959,646	+13.1	101.9	120.3	136.8	118.8	115.3	125.9	97.1	98.5	136.0	104.8
Apr. 11	814,233	679,808	+19.8	3,320,858	2,905,581	+14.3	102.5	120.3	137.3	118.7	115.3	126.8	97.1	99.0	132.5	105.4
Apr. 18	846,562	708,793	+19.4	3,307,700	2,897,307	+14.2	103.4	120.7	138.0	118.7	115.3	127.7	97.1	98.0	132.6	105.6
Apr. 25	861,353	721,627	+19.4	3,273,190	2,950,448	+10.9	103.8	120.7	138.0	118.7	115.3	128.0	97.1	99.0	132.9	106.3

MONTHLY STATISTICS

CHEMICAL:	Feb. 1942	Feb. 1941	1942 Jan.	1941 Jan.	Dec. 1941	Dec. 1940
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	No Longer Available					
Consumpt. in mfr. fert.						
Stocks end of month						
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal.					44,408,521	23,762,244
Comp. denat. prod., wine gal.					2,756,962	948,014
Removed, wine gal.					2,683,441	1,011,972
Stocks end of mo., wine gal.					203,692	453,090
Spec. denat. prod., wine gal.					15,945,814	11,266,809
Removed, wine gal.					15,604,829	11,427,406
Stocks end of mo., wine gal.					924,096	906,414
Ammonia sulfate prod., tons a	58,592	58,360	65,548	64,669	65,620	64,381
Benzol prod., gal. b	12,040,997	11,765,359	13,470,000	13,130,193	13,567,027	12,528,000
Byproduct coke, prod., tons a	4,715,585	4,502,091	5,229,297	4,932,989	5,186,420	4,890,030
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	922,605	720,173	1,113,319	719,336	989,700	715,240
Sheets, ship., lbs.	1,050,319	755,513	1,191,391	704,497	1,143,634	701,292
Rods, prod., lbs.	319,840	314,560	362,840	349,402	343,973	302,198
Rods, ship., lbs.	350,342	299,793	408,070	329,138	376,567	273,640
Tubes, prod., lbs.	134,158	97,399	141,438	97,794	150,920	91,219
Tubes, ship., lbs.	144,426	89,831	155,397	78,760	138,013	93,060
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	566,575	343,605	585,319	616,525	500,697	867,234
Shipments, lbs.	504,428	335,009	541,536	674,574	549,893	733,014
Molding comp., ship.; lbs.	3,224,519	1,641,978	3,597,003	1,583,885	3,165,174	1,317,352
Methanol (Bureau of the Census)						
Production, crude, gals.	No Longer Available					
Production, synthetic, gals.						
Pyroxylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds.	4,069,499	3,466,902	3,929,757	3,056,526	4,379,756	3,239,784
Heavy goods, ship., linear yds.	2,228,561	3,032,393	2,681,248	2,824,339	3,017,955	2,280,890
Pyroxylin spreads, lbs. c	5,472,578	6,262,184	6,041,991	5,993,335	6,637,412	5,642,519
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. d	Exports and Imports No Longer Available					
Crude sulfur d						
Coal-tar chemicals d						
Industrial chemicals d						
Imports						
Chemicals and related prod. d						
Coal-tar chemicals d						
Industrial chemicals d						
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	152.9	128.5	148.9	126.3	148.6	125.7
Other than petroleum	158.4	130.8	153.7	128.1	153.2	127.1
Chemicals	187.8	155.1	186.6	152.0	185.9	149.9
Explosives	Not Available		Not Available		Not Available	
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	208.0	144.8	203.3	142.1	200.9	143.9
Other than petroleum	216.8	148.7	213.0	145.2	209.2	145.4
Chemicals	277.1	143.9	280.0	188.2	271.6	187.9
Explosives	Not Available		Not Available		Not Available	
Price index chemicals*	96.3	85.7	95.3	85.6	88.6	77.7
Drugs & Pharmaceuticals*	126.5	96.9	126.3	96.5	123.0	96.2
Fert. mat.*	79.3	70.4	78.6	70.7	77.8	70.0
Paint and paint mat.	99.9	86.6	99.1	86.7	96.5	85.4
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertiliser and fert. materials	Exports and Imports No Longer Available					
Total phosphate rock						
Total potash fertilisers						
Imports (long tons, Nat. Fert. Association)						
Fertiliser and fert. materials						
Sodium nitrate						
Total potash fertiliser						

INDUSTRIAL TRENDS



Business: Industrial and business activity continued at a high rate during the past month. Sweeping Government regulations were proposed to combat the rising cost of living. Prices were frozen by the General Maximum Price Regulation issued by the Office of Production Management. The "New York Times" index of business activity went from 133.8 for week ending March 28 to 133.2 for week ending April 25. The Federal Reserve Board's index of industrial production for March remained at 172.

Steel: Production of ingots and castings in April totaled 7,122,313 tons. This was slightly under the record output of 7,392,911 tons in the longer month of March but was about 5½ per cent higher than in April, 1941. Average operating rate for April was 97.9 per cent compared with 98.2 in March and 97.6 in April, 1941.

Total production for first four months of year was 28,161,202 tons or 4 per cent more than first four months of 1941.

The W. P. B. Conservation order M-126 was issued to forbid the use of iron and steel in 400 items for civilian as well as military consumption. Steel demand carrying ratings of A-10 or higher amounts to 117 per cent of the industry's capacity during the current quarter.

Carloadings: Revenue freight loadings continued at the high levels of recent months. Shipments of coal and coke declined less than seasonally and ore loadings increased sharply. Grain shipments continued to decline from the peak reached in January.

State of Chemical Trade
Current Statistics (April 30, 1942)—p. 103

State of Chemical Trade

Current Statistics (April 30, 1942)—p. 104

The supply of cars will get tighter and the Government has issued further regulations concerning the utilization of rail cars. An order by the Office of Defense Transportation requires that cars carry at least six tons of merchandise. On July 1 this minimum will be raised to 8 tons and on September 1 to 10 tons.

Electric Output: The W P B has issued Order L-94 to handle power shortages wherever and whenever they occur. Two main lines of action are set out in the order. The first, which goes into operation at once, requires utilities to operate their systems in a way that will produce the maximum amount of power from their present capacity. In general, this calls for integrating or tying together the systems to permit transfer of power from one locality to another where the power is needed most.

The second part of the program, which will go into effect when and where a shortage occurs, establishes machinery for mandatory curtailment of power for commercial and industrial consumers. Provision is also made for curtailment of residential consumers.

Automotive: Re-tooling for production of war goods is nearly completed. Between 65 and 70% of the industry's machine tools have now been assigned to war work according to the Automotive Council for War Production.

Construction: According to F. W. Dodge Corp. the value of contract awards continued to increase in March. The first quarter of 1942 was the highest in recent years, being about 30 per cent above same period last year. Public work awards amounted to about 80 per cent of the total. Publicly financed factory construction awards showed sharp increase while private factory construction declined.

Retail Trade: Retail sales have maintained the good volume of recent months. The outlook for the second half of the year is unsettled because of price ceilings, curtailment of consumer credit and the plan for enforced savings.

Commodity Prices: The general level of wholesale prices continued to advance. On April 28 the General Maximum Price Regulation was issued, effective May 11, setting the highest prices charged in March, 1942 as ceilings on all commodities and rents, except for certain specified cases.

Outlook: A sharper rise in industrial output and tighter government controls of materials and services is forecast.

MONTHLY STATISTICS (cont'd)

	Feb. 1942	Feb. 1941	Jan. 1942	Jan. 1941	Dec. 1941	Dec. 1940
FERTILIZER: (Cont'd)						
Superphosphate e (Nat. Fert. Association)						
Production, total	402,160	334,697	430,810	338,546	435,745	359,890
Shipments, total	582,594	350,343	358,574	231,808	318,712	194,695
Northern area	201,212	129,961	127,120	88,013	157,671	86,089
Southern area	381,382	220,382	231,454	143,795	161,041	108,606
Stocks, end of month, total	1,636,086	1,967,724	1,786,112	1,943,182	1,662,143	1,785,445
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	1,088,923	858,255	1,272,676	545,772	273,482	183,604
Total, 12 southern	1,006,150	765,196	1,030,349	520,644	268,704	182,646
Total, 5 midwest	82,773	93,059	242,327	25,128	4,778	958
Fertilizer employment *i*	163.9	113.2	120.0	103.8	105.8	95.0
Fertilizer payrolls *i*	159.5	92.8	118.3	85.5	106.2	80.5
GENERAL:						
Acceptances outst'd'g *f*	$190	$211	$197	$212	.....	$208
Coal prod., anthracite, tons	4,772,000	4,430,000	.....	.....	4,118,000	4,671,000
Coal prod., bituminous, tons	43,840,000	41,450,000	.....	.....	46,667,000	40,600,000
Com. paper outst'd'g *f*	$388	$240	$380	$232	.....	.....
Failures, Dun & Bradstreet	.....	.....	.....	.....	.....	.....
Factory payrolls *i*	176.9	126.8	173.2	120.7	170.2	122.4
Factory employment *i*	132.9	117.8	132.5	115.5	134.3	116.2
GENERAL MANUFACTURING:						
Automotive production	134,134	485,622	238,261	500,878	282,205	483,567
Boot and Shoe prod., pairs	40,006,504	38,005,922	39,827,550	36,631,597	38,150,980	31,623,592
Bldg. contracts, Dodge *j*	$433,557	$270,373	.....	.....	431,626	456,189
Newsprint prod., U. S. tons	.....	.....	.....	.....	81,680	80,837
Newsprint prod., Canada, tons	.....	.....	.....	.....	300,823	252,897
Glass containers, gross‡	5,966,000	4,381,000	6,755,000	4,513,000	6,050,000	4,203,000
Plate glass prod., sq. ft.	.....	.....	.....	.....	17,491,200	10,310,900
Window glass prod., boxes	1,457,000	1,397,000	1,639,000	1,561,000	1,696,000	1,458,000
Steel ingot prod., tons	6,521,056	6,230,354	7,124,922	6,928,085	7,163,999	6,493,849
% steel capacity	96.0	96.5	94.7	96.9	98.1	94.1
Pig iron prod., tons	4,502,273	4,197,872	4,970,000	4,663,000	5,012,276	4,414,602
U.S. cons'pt. crude rub., lg. tons	No longer Available		.....	.....	.....	.....
Tire shipments	1,115,950	4,896,340	1,231,422	4,849,748	2,604,022	4,971,504
Tire production	1,112,907	5,161,267	1,368,787	5,486,296	2,967,387	4,998,520
Tire inventories	4,552,702	10,028,803	4,550,068	9,797,253	4,416,640	9,178,537
Cotton consumpt., bales	893,745	793,428	945,909	844,839	887,326	777,482
Cotton spindles oper.	23,077,722	22,769,368	23,077,352	22,829,220	23,063,112	22,799,060
Wool consumption *s*	47.6	47.0	50.3	46.9	62.3	46.6
Rayon deliv., lbs.	36,000,000	31,600,000	41,200,000	35,000,000	39,300,000	34,000,000
Rayon employment *i*	312.5	311.0	314.5	313.5	321.1	315.1
Rayon payrolls *i*	391.7	327.6	392.0	335.9	391.2	334.4
Soap employment *i*	91.4	89.8	90.8	85.9	92.3	84.8
Soap payrolls *i*	135.6	112.6	132.9	107.7	133.5	106.3
Paper and pulp employment *i*	130.0	117.3	129.5	115.7	129.1	115.9
Paper and pulp payrolls *i*	174.2	132.5	172.3	127.5	169.9	128.5
Leather employment *i*	97.4	88.1	96.4	85.8	98.2	85.8
Leather payrolls *i*	122.5	92.3	119.7	86.7	121.8	89.5
Glass employment *i*	125.8	115.8	128.9	114.4	132.0	116.8
Glass payrolls *i*	170.6	135.3	171.2	131.0	172.2	137.6
Rubber prod. employment *i*	98.9	100.7	100.6	98.8	110.8	97.5
Rubber prod. payrolls *i*	123.5	115.3	134.9	111.6	138.0	111.1
Dyeing and fin. employment *i*	136.9	139.7	133.7	134.9	134.8	134.3
Dyeing and fin. payrolls *i*	149.7	128.8	141.0	120.2	141.1	121.0
MISCELLANEOUS:						
Oils & Fats Index ('26 = 100)[1]	.....	.....	.....	82.4	143.3	.....
Gasoline prod., *p*	51,612	48,374	60,035	52,542	65,573	52,547
Cottonseed oil consumpt., bbls.	254,778	298,781	277,038	369,463	238,075	286,624
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments, dollars	$45,175,827	$33,690,870	$47,044,491	$34,604,629	$41,708,426	$28,308,153
Trade sales (580 estbts.) dollars	$22,126,413	$15,767,081	$22,842,005	$16,314,158	$18,660,761	$12,520,203
Industrial sales, total, dollars	$17,618,656	$14,973,684	$19,190,138	$15,092,044	$19,199,927	$13,434,963
Paint & Varnish, employ. *i*	141.6	128.6	140.7	126.3	142.2	126.0
Paint & Varnish, payrolls *i*	176.9	141.7	172.8	137.4	176.0	138.7

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 Census totals; *j* 000 omitted. 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census, in millions of lbs.; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; * New series beginning March, 1940; [1] Revised series beginning February, 1940.

Carbide & Carbon Nets $9,416,304

Union Carbide and Carbon Corporation reports for the first quarter, ending March 31st, 1942, net income of $9,416,304.35, after provision for increased taxes, equal to $1.0149 a share on 9,277,788 shares.

First quarter earnings of $1.0149 a share compare with $1.1366 a share in the first quarter of 1941.

Freeport Sulphur Earns 69¢ a Share

Consolidated net income of the Freeport Sulphur Company for the three months ended March 31, 1942, after all charges including depreciation, depletion and federal taxes, amounted to $549,611, equivalent to 69 cents a share on the 800,000 shares of common stock outstanding, Langbourne M. Williams, Jr., president, reported to directors recently.

These earnings compared with net income of $697,986 in the first quarter of 1941, which was equal to 87 cents a common share.

Hercules Earns $1,201,810

Hercules Powder Company reports for the quarter ended March 31, 1942, net earnings of $1,201,810 after estimated Federal taxes of $5,689,645 and a provision of $150,000 for contingencies. The estimated taxes include a provision of $990,000 for higher tax rates that may be applied retroactively to the quarter's earnings. The net earnings are equal, after payment of preferred dividends, to 81 cents a share on 1,316,710 shares of common stock outstanding during the period.

This compares with net earnings for the quarter ended March 31, 1941, of $1,360,426 after estimated Federal taxes of $2,018,440, equal after deferred dividends to 93 cents a share on 1,316,710 shares of common stock then outstanding.

Net sales of goods and services for the quarter were $27,271,477, compared with $15,798,855 in the same 1941 period.

Dividends and Dates

	Per Share	Stock Record	Payable
Atlas Powder Co.	.75	5-29	6-10
Colgate-Palmolive-Peet, Common	.125	4-17	6-15
$4.25 pref. (quar.)	1.06¼	6-9	6-30
Cum., pref. (quar.)	1.25	4-20	5-15
Freeport Sulphur Co. (quar.)	.50	5-15	6-1
Heyden Chemical Corp., Com.	.75	5-20	6-1
4¼% pref. A (quar.)	1.06¼	5-20	6-1
National Chemical & Mfg. Co. (quar.)	.15	4-15	5-1
New Jersey Zinc Co.	1.00	5-20	6-10
Phelps Dodge Corp.	.40	5-22	6-10
Standard Oil Co. of N. J. (S. A.)	.50	5-15	6-15
Extra	.50	5-15	6-15
Texas Gulf Sulphur Co. (quar.)	.50	6-1	6-15
United Chemicals, Inc., $3.00 pref. (quar.)	.75	5-11	6-1
Vick Chemical Co. (quar.)	.50	5-15	6-1
Extra	.10	5-15	6-1
Westvaco Chlorine Products Co.	.35	5-11	6-1

Earnings Statements Summarized

Company:	Annual dividends	Net income 1941	Net income 1940	Common share earnings 1941	Common share earnings 1940	Surplus after dividends 1941	Surplus after dividends 1940
Air Reduction Co. March 31 quarter	y$2.00	$ 1,495,548	$ 1,590,251	$ .55	$ .58	.....	.....
American Agricultural Chemical Co. Nine months, April 2	y1.45	1,169,983	153,206	1.86	.24	.....	.....
American Commercial Alcohol Corp.: March 31 quarter	f....	240,160	65,018	.92	.25	.....	.....
American Cyanamid Co.: March 31 quarter	x.60	1,127,927	1,120,505	c.38	c.39	.....	.....
American Potash & Chemical Corp.: Year, December 31	k2.00	1,054,860	2,378,008	2.00	4.50	.....	.....
Atlas Powder Co. March 31 quarter	y4.50	322,973	440,282	.93	1.41	.....	.....
Catalin Corp. of America: March 31 quarter	y.25	43,096	48,419	.08	.09	.....	.....
Climax Molybdenum March 31 quarter	y3.20	2,048,892	1,844,925	.81	.73	.....	.....
Corn Products Refining Co.: March 31 quarter	3.00	2,151,344	2,496,983	.68	.81	$176,197	$169,442
duPont de Nemours & Co., E. I. March 31 quarter	y6.50	14,310,157	20,754,161	j1.18	j1.77	d1,486,825	d507,408
Duval Texas Sulphur Co.: March 31 quarter	y1.25	226,953	*.....	.45	....	.....	.....
Twelve months, March 31	y1.25	833,675	*.....	1.67	....	.....	.....
Freeport Sulphur Co.: March 31 quarter	y2.00	549,611	697,985	.69	.87	.....	.....
Hercules Powder Co.: March 31 quarter	y3.00	1,201,810	1,360,426	.81	.93	.....	.....
Mathieson Alkali Works: March 31 quarter	y1.75	344,861	403,515	.37	.44	.....	.....
National Oil Products Co.: March 31 quarter	y1.45	187,350	139,707	.87	.65	.....	.....
Newport Industries, Inc.: March 31 quarter	y.95	174,498	z110,959	.28	....	.....	.....
Twelve months, March 31	y.95	771,435	z270,256	1.24	....	.....	.....
Texas Gulf Sulphur Co., Inc.: March 31 quarter	y2.50	1,829,485	2,147,381	.48	.56	.....	.....
Union Carbide & Carbon Corp.: March 31 quarter	y3.00	9,416,304	10,545,635	1.01	1.14	.....	.....
Victor Chemical Works: March 31 quarter	y1.40	263,404	245,461	h.35	h.35	.....	.....

a On Class A shares; b On Class B shares; c On Combined Class A and Class B shares; d Deficit. f No common dividend; j On average number of shares; k For the year 1940; b On Preferred stock; On Class A shares; y Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; n Preliminary statement; h On shares outstanding at close of respective periods. ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period. ‡‡ Indicated earnings as compiled from quarterly reports. † Net loss. * Not available. ¶¶ Before interest on income notes. x Paid on or declared in last 12 months plus extra stock. w Last dividend declared, period not announced by company.

Price Trend of Representative Chemical Company Stocks

	April 4	April 11	April 18	April 25	Net gain or loss last mo.	Price on Apr. 26 1941	1942 High	1942 Low
Air Reduction	32⅞	33¼	30¾	30½	— 2⅜	36	38¼	29½
Allied Chemical & Dye Corp.	126	126½	125	119	— 7	148	149	118½
Amer. Agric. Chem.	22	21½	19⅞	21	— 1	15⅛	23⅝	19
Amer. Cyanamid "B"	30⅜	31	30	30	— ⅜	34¾	41⅞	30
Columbian Carbon	60	62	62½	60½	+ ½	71⅛	72	51
Commercial Solvents	8	8¼	8⅛	8⅛	+ ⅛	9⅝	9¾	7⅜
Dow Chemical Co.	100¼	101	109⅛	97⅛	— 3⅛	124⅜	124¼	95
duPont	111¾	111¼	111½	104⅞	— 6⅞	140⅛	144	103
Hercules Powder	56	58	54	51½	— 4½	67½	72	51
Mathieson Alkali Works	24	23	21½	22	— 2	24¾	29½	20¾
Monsanto	72½	73⅛	72	68	— 4½	79½	96	66¾
Standard Oil of N.J.	34	33⅞	33	31⅛	— 2⅞	35½	42¼	30½
Texas Gulf Sulphur	31¾	30¼	29½	28⅞	— 2⅞	31⅝	34⅞	28
Union Carbide & Carbon	60½	59¼	59⅜	59	— 1½	63½	74¼	58
United Carbon Co.	40½	40½	39½	39½	— 1	....	42⅞	37
U.S. Industrial Alcohol	31	29¾	27¾	25	— 6	22	34¼	24½

N. J. Zinc Earns $4.88

New Jersey Zinc Co. reports for year ended December 31, 1941, net income of $9,592,871 after depreciation, depletion, contingencies, federal taxes, etc., equal to $4.88 a share on 1,963,264 shares of capital stock.

This compares with $8,236,815 or $4.19 a share in 1940.

For quarter ended December 31, last, net income was $2,559,481, equal to $1.30 a share, comparing with $3,122,351 or $1.59 a share in December quarter of previous year, and $2,519,490 or $1.28 a share in quarter ended September 30, 1941.

Pittsburgh Plate Earnings Up

Pittsburgh Plate Glass Co. and subsidiaries in report for year ended December 31, 1941, certified by independent auditors, show net profit of $14,989,178 after depreciation, depletion and provision of $15,183,000 for federal income and excess profits taxes. Above net is equal to $6.82 a share on 2,198,438 shares of capital stock, excluding 5,200 treasury shares.

This compares with $13,793,937 or $6.30 a share on 2,188,040 shares in 1940. Federal income and excess profits taxes for 1940 amounted to $5,841,474.

Chemical Finances
April, 1942—p. 104

Chemical Finances
April, 1942—p. 105

Chemical Stocks and Bonds

PRICE RANGE 1942 April Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Stocks	Par $	Shares Listed	Dividends 1941*	Earnings** $-per-share-$ 1941	1940	1939
NEW YORK STOCK EXCHANGE													
38½	49⅞	37¾	55¾	46	70¼	49¼	Abbott Labs.	No	755,204	1.60	2.90	2.89	2.61
30	38¼	29½	45	34⅝	58⅛	36½	Air Reduction	No	2,736,855	2.00	2.62	2.38	1.98
120	149	118½	167½	135	182	135½	Allied Chem. & Dye	No	2,401,288	6.00	9.67	9.43	9.50
21	23⅝	19	22⅞	14⅜	21	12⅛	Amer. Agric. Chem.	No	627,981	1.45	1.79	1.45	1.22
7⅜	9¾	7½	9⅞	4⅞	8¼	4⅛	Amer. Com. Alcohol	No	260,934	...	4.03	.22	—.38
27¾	35	27⅜	35	26	35½	23	Archer-Dan.-Midland	No	545,416	1.85	5.69	5.42	3.02
44⅛	70	44	72¼	61	80½	57	Atlas Powder Co.	No	254,827	4.50	6.13	5.71	3.82
113	116	112	121	111	124¾	112½	5% conv. cum. pfd.	100	68,597	5.00	27.77	26.01	18.94
15⅝	21¼	15	20¾	18½	35½	20	Celanese Corp. Amer.	No	1,376,551	2.00	3.43	2.90	3.53
112½	120⅜	110	123⅛	116⅝	121	105½	prior pfd.	100	164,818	7.00	35.08	38.69	38.67
12⅝	13⅝	11½	16¼	10⅞	20	10⅛	Colgate-Palm.-Peet	No	1,962,087	0.50	3.09	1.62	2.74
59½	72	51	83	64	98¾	71	Columbian Carbon	No	537,406	4.70	6.57	5.71	5.32
8	9¾	7⅞	11⅞	7½	16⅝	8	Commercial Solvents	No	2,636,878	0.55	.99	.91	.61
44¼	55¾	42¼	55¾	42¼	65⅛	40¼	Corn Products	25	2,530,000	3.00	3.37	3.10	3.32
159	174	159	182½	164	184	165	7% cum. pfd.	100	245,738	7.00	41.78	7.23	7.70
17¼	21	14	21	12¼	23¾	12½	Devoe & Rayn. A.	No	95,000	1.00	7.08	1.14	2.08
96¼	124¼	95	141⅝	111½	171	127¼	Dow Chemical	No	1,135,187	3.00	6.58	6.65	3.76
105⅛	144	103	164⅝	125⅛	189¼	146½	DuPont de Nemours	20	11,065,762	7.00	7.50	7.23	7.70
122	126½	120	127	120⅞	129⅝	114	4½% pfd.	No	1,688,850	4.50	53.53	51.48	52.25
111	141	108	145½	120¼	166⅝	117	Eastman Kodak	No	2,488,242	6.00	8.57	7.96	8.55
170½	176	170	182½	160	180	155	6% cum.	100	61,657	6.00	350.14	325.62	337.65
27¾	38¾	27	41	32½	39¼	24¾	Freeport Sulphur	10	796,380	2.00	3.95	3.81	2.76
4¾	5¾	4½	7⅜	4⅞	10	5½	Gen. Printing Ink	1	735,960	0.65	1.00	.86	.94
12⅝	15	12½	17⅞	11	19¾	11	Glidden Co.	No	829,989	1.50	3.08	1.56	1.70
40½	44	37¾	46	35	45	30	4½% cum. pfd.	50	199,940	2.25	15.08	8.64	9.27
80	93½	79¼	96	76	113¼	89⅞	Hazel Atlas	25	434,409	5.00	6.63	5.98	6.60
53¼	72	51	80¼	65¼	100½	69	Hercules Powder	No	1,316,710	3.00	4.23	4.01	3.65
128	129¼	125	132½	123½	133½	126¼	6% cum. pfd.	100	96,194	6.00	69.71	66.38	60.87
21⅝	27	21	29⅞	20¾	29	16⅜	Industrial Rayon	No	759,325	2.50	3.04	3.51	1.77
20	23½	19¾	27	19	47⅝	21¼	Interchem.	No	290,320	1.60	6.01	2.47	4.10
104½	111½	103	113¼	107	113	91	6% pfd.	100	65,661	6.00	32.79	16.99	24.27
x4¼	x5	x3⅝	..	..	..	..	Intern. Min. & Ch.	5	473,981	...	...	...	...
x41	x41	x38	..	..	..	..	4% cum. pfd.	100	100,000	...	...	...	...
25	28¾	24½	31⅜	23	38⅞	19⅝	Intern. Nickel	No	14,584,025	2.00	2.22	2.30	2.39
40	48¼	39	49	38¼	39⅝	26⅞	Intern. Salt	No	240,000	3.00	3.76	3.98	1.92
18	20⅜	17½	22	17¼	23¾	14⅜	Kellogg (Spencer)	No	509,213	1.70	...	...	1.39
22	23⅝	20½	45⅜	19⅛	53⅜	30	Libbey Owens Ford	No	2,513,258	3.50	3.52	3.97	3.21
12	15½	11¾	16⅝	13	18⅝	10⅛	Liquid Carbonic	No	728,100	1.00	2.92	2.21	1.62
21¼	29½	21	31¼	24⅛	32⅝	21	Mathieson Alkali	No	828,171	1.50	1.90	1.72	1.12
68¼	91	66¾	94	77	119	79	Monsanto Chem.	No	1,241,816	3.00	4.90	4.32	4.01
111	117½	110½	118½	112	119	110	4½% pfd. A.	No	50,000	4.50	38.43	57.38	54.29
116	119	116	123	115	122	113½	4½% pfd. B.	No	50,000	4.50	38.43	57.38	54.29
102⅝	110⅜	102½	113½	108⅞	...	...	4 % pfd. C.	No	50,000	4.50	38.43	...	...
12⅝	16¼	11⅞	19¼	12¼	22½	14⅛	National Lead	10	3,090,664	0.50	1.10	1.34	1.23
148	168	148	176	100½	176	160	7% cum. "A" pfd.	100	213,793	7.00	24.68	28.54	27.04
134	146	129	154	138	153¾	132	6% cum. "B" pfd.	100	103,277	6.00	49.99	59.46	55.30
29½	35	29½	36	26	44	28¾	National Oil Products	4	179,829	1.95	4.11	3.92	3.89
7⅞	11⅝	7¼	11⅞	5⅝	14¼	6⅛	Newport Industries	1	621,359	0.75	1.14	0.50	0.66
44	54	43¼	54	38¾	64⅝	42	Owens-Illinois Glass	12.50	2,661,204	2.50	3.40	2.71	3.17
45⅛	52	42	61½	47½	71¾	53	Procter & Gamble	No	6,409,418	2.00	...	4.37	3.80
118	119	115	120	115	118½	112½	5% pfd.	100	169,517	5.00	...	338.78	298.55
11	14¾	10⅛	16¾	10⅛	13¼	7⅞	Shell Union Oil	No	13,070,625	1.00	...	1.05	0.77
20	28½	19⅝	35¼	18⅞	23¼	12¾	Skelly Oil	No	961,349	1.50	...	3.28	1.99
20⅜	27½	20	34½	24⅞	29	20⅜	S. O. Indiana	25	15,272,020	1.00	...	2.20	2.24
31⅞	42¾	30½	46⅞	33	46½	29⅞	S. O. New Jersey	25	27,278,666	1.00	...	4.54	3.27
8⅛	9⅜	8	9⅝	6	9¾	4¼	Tenn. Corp.	5	853,696	1.00	1 60	1.36	0.41
31¼	39¼	30	46⅜	34½	47⅝	33	Texas Corp.	25	10,876,882	2.00	4.77	2.90	3.02
28⅝	34⅞	28	38⅞	30½	37¼	26⅞	Texas Gulf Sulphur	No	3,840,000	2.50	...	2.38	2.04
59¼	74¾	58	79⅞	60	88⅜	59⅞	Union Carbide & Carbon	No	9,277,288	3.00	4.53	4.55	3.86
38	42⅞	37½	52	35	65⅝	42½	United Carbon	No	397,885	3.00	...	3.36	3.81
25½	34¼	24½	34¼	20	28	14	U. S. Indus. Alcohol	No	391,238	1.00	...	2.73	1.06
15¼	20⅞	15	34⅛	15½	43⅞	25	Vanadium Corp. Amer.	No	405,706	1.50	3.03	2.85	3 25
20½	25½	20⅜	27¼	20	31½	14	Victor Chem.	5	696,000	1.40	...	1.45	1.59
1½	2⅛	1	2½	⅝	4⅛	1¾	Virginia-Caro. Chem.	No	486,122	...	...	—1.36	—1.57
28⅞	30	22½	29½	18⅞	31⅝	14	6% cum. part. pfd.	100	213,052	1.00	...	2.89	2.41
25	31½	22	36½	27¼	38½	27¾	Westvaco Chlorine	No	553,132	1.85	2.92	2.96	2.91
104	106½	103¼	112	105	109⅞	108	cum. pfd.	No	59,885	4.50	...	21.96	...
NEW YORK STOCK EXCHANGE													
30¼	41⅞	29½	42⅝	31	39⅞	26	Amer. Cyanamid "B"	10	2,618,387	0.60	2.42	2.44	2.07
7⅝	7⅝	6⅞	7⅝	6⅜	8¼	5	Duval Texas Sulphur	No	500,000	1.25	...	1.16	1.25
68	88½	68	99	65	92	60	Heyden Chem. Corp.	100	104,983	3.00	9 04	7.86	5.98
57½	63	55¼	96¾	55	104	65	Pittsburgh Plate Glass	25	2,188,040	5.00	...	6.30	4.94
61¼	70	59¾	84	61	100	62½	Sherwin Williams	25	638,927	3.00	...	6.57	5.96
111¾	113	110	115½	108½	114¾	106	5% cum. pfd.	50	122,289	5.00	...	39.49	35.08
PHILADELPHIA STOCK EXCHANGE													
149	175½	135	185	162	192	158¾	Pennsylvania Salt	50	150,000	8.00	...	...	10.52

PRICE RANGE 1942 April Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE											
102¼	104¼	101⅝	104½	100⅝	105¼	100¼	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
35¼	40¼	34	42¾	26½	41	27½	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
37	40	35	40	25⅝	39¾	27	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
96¼	97⅞	95¾	99⅞	94⅜	100¼	93½	Shell Union Oil	1954	2½	J-J	85,000,000
104½	105½	103½	106¾	102½	107	101¼	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
104½	105⅝	103¾	150⅝	103	107	100⅝	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
105½	105¾	104½	107⅞	102⅞	108¼	102	Texas Corp.	1959	3	A-O	40,000,000

* Including extras paid in cash.
** For either fiscal or calendar year.
x New stock.

New Trade Marks of the Month

394,627

SHU-SHINE
431,739

FLIGO
433,117

GEM-COTE
439,017

SILENE
440,210

LOBRIN
440,652

AQUACEL
442,187

443,060

PLASKON
445,331

AJAX
445,685

Loalin
446,261

SIMPLEX
448,347

448,824

AQUOTE
449,020

STROBLITE
449,302

W. T. P.
449,303

SANTOWAX
449,463

449,388

449,500

PINCENE
449,540

7-70-7
450,030

FLOOR-SAN
450,228

COPPA-TONE
450,233

KIL-TONE
450,234

ROTEX 75 DUST
450,240

ACRYLOID
450,405

Charm-Kurl
450,445

PROMOTRON
450,461

SUNWAY
450,496

NO-CLOR
450,543

Isogel
450,657

SIZOGEL
450,658

WARICH
450,669

BUG-NO
450,683

450,688

RAT-NO
450,692

Trade Mark Descriptions †

394,627. Sears, Roebuck and Co.; Chicago, Ill.; Feb. 28, '40; for liquid used for cleaning glass; since Aug. 16, '38.

431,739. Osmic Chemical Co.; Brockton, Mass.; May 9, '40; for liquid cleaner and spot remover for fabrics and gabardine cleaner; since '38.

433,117. Hazel Adams, Coffeyville, Kansas; June 18, '40; for fly spray; since Apr. 12, '36.

433,443. Eli Lilly and Co.; Indianapolis, Ind.; June 27, '40; for medicinal preparation containing an aqueous solution of a condensation product derived from the reaction of a sulfonic acid with formaldehyde used in the treatment of cervicitis and trichomonas vaginitis; since Mar. 19, '40.

439,017. Gemloid Corp.; Elmhurst, L. I., N. Y.; Dec. 19, '40; for chemical preparations designed to be applied to printed matter, pictures, papers, etc. for rendering same grease, water and vapor-proof as well as alkali, acid, and alcohol resistant; since Sept. 1, '40.

440,210. Pittsburgh Plate Glass Co.; Pittsburgh, Pa.; Feb. 1, '41; for alkaline earth metal silicate having pigmentary properties; since June 12, '39.

442,187. Brown Co.; Portland, Maine; and Berlin, N. H.; Apr. 2, '41; for cellulose pulps; since Mar. 7, '41.

443,060. Joseph Uddo (Johnson Chemical Co.); Bklyn, N. Y.; Apr. 28, '41; for disinfectant; since Feb. 25, '41.

445,331. Plaskon Company, Inc.; Toledo, O.; July 14, '41; for lacquers, lacquer resins, paint enamels, baking enamels, and paints in dry form and in paste form; since May 4, '38.

445,685. Commercial Solvents Corp.; New York, N. Y.; July 28, '41; for leak compounds, anti-rust compounds, flushing compounds; since June 13, '41.

446,261. Catalin Corp.; New York, N. Y.; Aug. 15, '41; for resinous material for use as a molding powder and the like since Aug. 1, '41.

448,347. Sutton & Sons, Ltd.; Reading, Eng.; Nov. 1, '41; for fertilizers; since '26.

448,824. Jacob Fuchs, Brooklyn, N. Y.; Nov. 22, '41; for casein glue in the form of a dry powder; since Jan. 1, '25.

449,020. Red Spot Paint and Varnish Co., Inc.; Evansville, Ind.; Nov. 28, '41; for protective coating in the nature of a paint; since June, '39.

449,302. Alexander Strobl, (Stroblite Co.); New York, N. Y.; Dec. 8, '41; for phosphorescent and fluorescent lacquers, paints, and paint pigments; since Jan. 1, '26.

449,303. Alexander Strobl (WTP); New York, N. Y.; Dec. 8, '41; for phosphorescent and fluorescent lacquers, paints and paint pigments; since Nov. 9, '41.

449,388. Peacock Labs, Inc.; Philadelphia, Pa.; Dec. 11, '41; for liquid cleaner for removing stains resulting from the action of silvering solutions from the hands, etc. of those engaged in making mirrors; since Nov. 3, '41.

449,463. Monsanto Chem. Co.; St. Louis, Mo.; Dec. 13, '41; for solid waxy materials; since Oct. 17, '38.

449,500. K. J. Quinn & Co., Inc.; Boston, Mass.; for shoe and leather finishes—namely polish, dressing, lacquers, wash, shank ink, and color repairer; since Jan., '09.

449,540. John H. Breck, Inc.; Springfield, Mass.; Dec. 17, '41; for liquid material for cleaning the hair after shampooing; since Nov. 1, '41.

450,030. Stanley Home Products, Inc.; Westfield, Mass.; Jan. 6, '42; for insecticides; since May, '37.

450,228. Huntington Labs., Inc.; Huntington, Ind.; Jan. 15, '42; for liquid soap for cleansing wood, linoleum, terrazzo, marble, tile and similar surfaces; since June, '25.

450,233. John Lucas and Co., Inc.; Philadelphia, Pa.; Jan. 15, '42; for insecticides and fungicides; since Mar. 13, '26.

450,234. John Lucas and Co., Inc.; Philadelphia, Pa.; Jan. 15, '42; for insecticides and fungicides; since Jan., '13.

450,240. Miller Chemical & Fertilizer Corp.; Baltimore, Md.; Jan. 15, '42; for insecticides spray for vegetation; since Dec. 1, '41.

450,405. Rohm & Haas Company, Philadelphia, Pa.; Jan. 22, '42; for chemicals used in the manufacture of lubricants and hydraulic fluids; since Sept. 16, '40.

450,445. Charm-Kurl Company, St. Paul, Minn.; Jan. 24, '42; for permanent wave preparation in powder form; since Mar. 27, '41.

450,461. Schering Corp.; Bloomfield, N. J.; Jan. 24, '42; for medicinal preparation recommended for the treatment of disorders of the male sex glands; since Jan. 16, '42.

450,496. Sunway Vitamin Co.; Chicago, Ill.; Jan. 26, '42; for therapeutic vitamin preparation; since Aug., '41.

450,543. H. Kohnstamm & Co., Inc.; New York, N. Y.; Jan. 28, '42; for washing compound for laundry purposes; since Jan. 2, '42.

450,657. National Aluminates Corp.; Chicago, Ill.; Feb. 2, '42; for chemical compositions used in the sizing and improvement of cellulosic products; since Jan. 15, '42.

450,658. National Aluminate Corp.; Chicago, Ill.; Feb. 2, '42; for chemical compositions used in the sizing and improvement of cellulosic products; since Jan. 15, '42.

450,669. Warich Drug Co., Inc.; Richmond Hill, L. I., N. Y.; Feb. 2, '42; for various chemicals and chemical specialties; since Mar. 17, '40.

450,683. W. H. Plunkett (Plunkett Chemical Co.); Chicago, Ill.; Feb. 3, '42; for insecticides; since June 1, '20.

450,688. W. H. Plunkett (Plunkett Chemical Co.); Chicago, Ill.; Feb. 3, '42; for cleaning compound for porcelain and metal surfaces, cleanser with disinfecting properties, and liquid soap; cleaning compound since about June 1, '10; cleanser with disinfecting properties since about June 1, '20; and liquid soap since about June 1, '30.

† Trademarks reproduced and described include those appearing in the *Official Gazette* of the *U. S. Patent Office*, April 7 to 28.

New Trade Marks of the Month

BLITZGLAS
450,767

450,986

BURAMINE
451,091

451,316

Lakeside
451,552.

Phenitol
450,786

ROSUL
451,103

AGOMEN
451,668

450,988

SEALINX
451,332

SISTOMEN
451,669

RENOVENE
450,693

CEMAR
451,142

TRASENTINE
451,670

Davitin
451,333

450,771

IROX
451,019

duMag
451,165

DICOCE
451,694

APPLE-A-DAY
451,178

SUCROCEL
451,041

VITULES
451,335

GOLDEN GLOW
451,708

CHIMNEY SWEEP
451,187

VERDANT
450,776

NICOMIDE
451,419

494,390

451,080

Staymone
450,910

451,226

KARDIAMINE
451,471

Trade Mark Descriptions (*Cont'd.*)

450,692. W. H. Plunkett (Plunkett Chemical Co.); Chicago, Ill.; Feb. 3, '42; for rodenticide; since June 1, '20.

450,693. W. H. Plunkett (Plunkett Chemical Co.); Chicago, Ill.; Feb. 3, '42; for cleaning compound for porcelain and metal surfaces; since June 1, '10.

450,767. Max B. Heim; New York, N. Y.; Feb. 5, '42; for plate glass substitute made from synthetic resin or any other material; since Jan. 15, '42.

450,771. Leo J. Rampel (Perm-Aseptic Co.); New York, N. Y.; Feb. 5, '42; for antiseptic, germicidal, and fungicidal preparation for use on textiles, plastic materials, leather, rubber and paper; since Nov. 3, '41.

450,776. Arnour and Co. of Delaware, Chicago, Ill.; Feb. 6, '42; for soaps; since May 21, '41.

450,786. Chicago Pharmacal Co.; Chicago, Ill.; Feb. 6, '42; for pharmaceutical ointment for local application in the treatment of bacterial infection of the skin; since Jan. 22, '35.

450,910. A. E. Staley Mfg. Co.; Decatur, Ill.; Feb. 11, '42; for plant growth promoting substances having characteristics of what are commonly known as chemical hormones; since Jan. 23, '42.

450,986. American Oil Company, Baltimore, Md.; for anti-freeze, brake fluid, insect spray; since Oct. 7, '30.

450,988. American Oil Co.; Baltimore, Md.; Feb. 16, '42; for anti-freeze, brake fluid, insect spray; since Oct. 7, '30.

451,019. Reichard-Coulston, Inc.; New York, N. Y.; Feb. 16, '42; for oxides of iron; since May, '35.

451,041. Sucro-Blanc, Inc.; New York, N. Y.; Feb. 17, '42; for thermally activated bauxite for adsorptive decolorization; since Oct., '40.

451,080. Gimbel Bros., Inc.; New York, N. Y.; Feb. 19, '42; for soap; since Feb. 1, '42.

451,091. Sharples Chemicals, Inc.; Philadelphia, Pa.; Feb. 19, '42; for synthetic organic chemicals which are alkylated acid amides and substances derived therefrom; since Mar. 9, '40.

451,103. Central Chemical Corp. of Maryland, Hagerstown, Md.; Feb. 20, '42; for chemicals and insecticides for spraying and dusting purposes; since Nov. 17, '41.

451,142. Charles E. Maher (Style Cemar Co.); Chicago, Ill.; Feb. 21, '42; for dye removing materials, dyeing materials, and fabric finishing materials; since Oct. 13, '39.

451,157. Ralph D. Allum, New York, N. Y.; Feb. 23, '42; for natural citrus fruit concentrate and for citrus fruit concentrate fortified with ascorbic acid, for use in vitamin C deficiencies; since Feb. 9, '42.

451,165. Dugas Engineering Corp.; Marinette, Wis.; Feb. 23, '42; for dry extinguishing compound for magnesium, potassium, sodium, aluminum, zinc, iron and other metal fires, incendiaries, and burning inflammable materials; since Feb. 16, '42.

451,178. Nyal Co.; Detroit, Mich.; Feb. 23, '42; for vitamin preparation; since Feb. 5, '42.

451,187. G. N. Coughlan Co.; Orange, N. J.; Feb. 24, '42; for chemical powder used as a fire scale and soot eradicator; since Aug. 7, '41.

451,226. The Martin Dennis Co.; Newark, N. J.; Feb. 26, '42; for liquid chemical preparation used as a coating for preserving paper; since Oct. 4, '41.

451,316. Novocol Chemical Mfg. Co., Inc.; Bklyn., N. Y.; Feb. 28, '42; for local anesthetics in solution and ointment; since Dec. 5, '41.

451,332. Addressograph-Multigraph Corp.; Cleveland, O.; Mar. 2, '42; for materials and solutions for treating printing plates to prepare and preserve reproducible images thereon; since Aug. 30, '34.

451,333. American Home Products Corp.; Jersey City, N. J.; Mar. 2, '42; for medicinal vitamin preparations; since Jan. 12, '42.

451,335. The Bovinine Co.; Jersey City, N. J.; Mar. 2, '42; for medicinal vitamin preparations; since Feb. 2, '42.

451,419. Premo Pharmaceutical Labs, Inc.; New York, N. Y.; Mar. 5, '42; for vitamin concentrate in capsule, tablet and liquid form; since Apr. 18, '41.

451,471. F. J. Mann, Inc.; L. I. City, N. Y.; Mar. 7, '42; for pharmaceutical preparation to be used as a heart stimulant containing pyridine-B-carboxylic acid diethylamide; since Feb. 26, '42.

451,552. The Lakeside Laboratories, Inc.; Milwaukee, Wis.; Mar. 11, '42; for various drugs and pharmaceuticals; since Oct. 21, '24.

451,668. Ciba Pharmaceutical Prods., Inc.; Summit, N. J.; Mar. 17, '42; for water soluble ovarian extract; since May 3, '40.

451,669. Ciba Pharmaceutical Prods., Inc.; Summit, N. J.; Mar. 17, '42; for lipo-soluble ovarian extract; since May 3, '40.

451,670. Ciba Pharmaceutical Prods., Inc.; Summit, N. J.; Mar. 17, '42; for antispasmodic; since Feb. 11, '42.

451,694. E. R. Squibb & Sons, New York, N. Y.; Mar. 17, '42; for anticoccidiotic preparations; since June 20, '41.

451,708. Geo. P. Braun Co., Chicago, Ill.; Mar. 18, '42; for vitamin fortifier, a compound or preparation used to fortify foods deficient in vitamins; since Sept. 26, '40.

494,390. Peacock Labs, Inc.; Philadelphia, Pa.; Dec. 11, '41; for tartaric acid, epsom salts, thiourea, tin chloride, rochelle salts, lead nitrate, silver nitrate, sodium hydroxide, ammonium water and nitric acid; since Nov. 3, '41.

War Regulations
Priorities, Allocations, Import and Price Controls—p. 25

Summary of War Regulations

There are no more important subjects to the chemical industry today than priorities, allocations, import and price controls. Chemical Industries, last month, chronologically digested the important regulations up to Feb. 28, 1942. This month new regulations are brought up to March 31, 1942. Next month and each month thereafter additional and revised regulations will be given.

By way of explanation a "P" order identifies a limited blanket rating given to a company, or an industry to facilitate the acquisition of scarce materials needed by such companies for defense or essential civilian production.

Distribution of commodities under industry-wide control generally is governed by "M" (material) orders, regulating distribution and flow of a given material into defense or essential civilian production channels.

Limits on the production of materials are covered by "L" limitation orders.

Rigid government controls for the war's duration over retail and wholesale prices and rents were announced by Price Administrator Leon Henderson on April 28.

In a single sweeping order—the General Maximum Price Regulation—the Administrator set the highest prices charged in March, 1942, as an absolute ceiling over virtually everything that Americans eat, wear, and use. The only exemptions are a limited list of food commodities. Companion orders paved the way for Federal control of rents in 302 defense areas in 46 States and Puerto Rico, housing more than 76,000,000 persons, and set separate ceilings for a broad range of commodities and products.

By its terms, the General Maximum Price Regulation requires that: (1) Beginning May 18, retail prices, with a few exceptions, must not exceed the highest levels which each individual seller charged during March 1942. (2) Beginning May 11, manufacturer and wholesale prices and the prices for wholesale and industrial services must not exceed the highest March levels for each seller. (3) Beginning July 1, no one may charge more for services sold at retail in connection with a commodity than he charged during March. (4) Effective *immediately*, all retailers, wholesalers, manufacturers and sellers of services must preserve existing records of sales made during March for maximum pricing purposes when the ceiling goes into effect.

"Highest price charged" means two things:

First it means the top price for which an article was delivered during March, 1942, in completion of a sale to a purchaser of the same class. Customary allowances, discounts or other price differentials cannot be changed, except to lower the price. Thus a physician who buys bandages or proprietary medicines from a local drugstore will, if he has a professional discount, continue to receive the benefit of a lower maximum price than an ordinary citizen. Second, if there was no actual delivery of a particular article during March, the seller may establish as his maximum price the highest price at which he offered the article for sale during that month. This permits the use of a list price if no completed sale occurred in March. Conversely however, if there was a completed sale at a price under the list price the actual sale price must be used as the maximum. The "offering price" where used to set the maximum price cannot be a "freak" price quoted to open bargaining or one never intended to apply to a bona fide sale.

Benzene

April 20, 1942. WPB issues Conservation order M-137 stopping immediately the use of benzene, except that any producer or distributor may use within next 30 days one-sixth of the amount he used for the three months ended March 31.

Brass

April 19, 1942. OPA announces that thirteen firms, producing more than 95 per cent of the brass materials used for small arms ammunitions, have agreed to reduce prices of these products one cent per pound.

Chlorine

April 20, 1942. WPB issues amendment No. 1 to Limitations order L-11 to restrict use of chlorine in pulp, paper and paperboard. Changes basis of limitation to amount used per ton of rag stock treated.

Copper

April 17, 1942. The Cincinnati Railway Supply Co., Cincinnati, Ohio, is permitted to charge and receive premiums on casting copper sales in less-than-carload lots from its Cleveland, Ohio, warehouse under Amendment No. 1 to Revised Price Schedule No. 15 (Copper), issued by OPA. These premiums are one cent per pound in quantities of less than 5,000 pounds and ¾ cent per pound in quantities up to carload.

The Office of Price Administration, in a blanket order, No. 1, to the same schedule, grants permission to carry out certain contracts to certain sellers who, prior to August 12, 1941, the effective date of the schedule, had contracted to deliver or transfer copper thereafter at not more than ½ cent per pound over the schedule's maximum prices.

April 17, 1942. Supplementing the Metal Reserve Company program for increasing the copper supply in this country by encouraging the copper refiners to buy yellow brass scrap for conversion into electrolytic copper, the Office of Price Administration fixed maximum prices for all yellow brass scrap except Yellow Brass Castings on a copper content basis. The prices are set forth in Amendment No. 3 to Revised Price Schedule No. 20 (Copper and Copper Alloy Scrap).

Fluorspar

April 30, 1942. Formal price ceilings for Fluorspar at levels generally prevailing on January 2, 1942, were announced by OPA.

The maximum prices—contained in Maximum Price Regulation No. 126 become effective May 11.

Glycerine

April 23, 1942. Harshaw Chemical Co., Cleveland, was authorized today by OPA to sell to the Treasury Procurement Division approximately 45 tons of dynamite glycerine at a price reflecting only cost, but nevertheless exceeding the maximum prices set by OPA Revised Price Schedule 38.

The glycerine in question was refined from crude glycerine purchased in South America before OPA imposed ceiling prices. The contract price exceeded the maximums thereafter set by OPA. Because of transportation difficulties the crude product was not delivered to Harshaw until recently.

Harshaw converted the crude glycerine into refined glycerine of dynamite grade essential to the war effort and offered to transfer the full amount to the Treasury Procurement Division without profit. By Amendment No. 1 to Revised Price Schedule No. 38, OPA approved this transaction.

Hide Glue

April 29, 1942. To compensate some middlemen and jobbers for added expenses they incur in collecting hide glue stock from small producers to make it available for needed hide glue, OPA has issued Amendment No. 3 to Revised Price Schedule No. 68 (Hide Glue Stock), effective April 30.

War Regulations
Priorities, Allocations, Import and Price Controls—p. 25

War Regulations
Priorities, Allocations, Import and Price Controls—p. 26

The amendment provides that in the case of a shipment from a seller's shipping point other than a producer's plant, the maximum prices are the prices established in the schedule, plus the actual transportation charge from the producer's plant at which the hide glue stock was produced to such seller's shipping point, f. o. b. such seller's shipping point.

The amendment also clarifies the definition "seller's shipping point" to mean "the point of production or other point of distribution maintained by a producer or seller from which actual shipment is made."

Industrial Alcohol

April 28, 1942. Beverage alcohol from 100 to 189 proof, known in industry as "high wine", today was placed under complete allocation control so it can be used to augment the nation's industrial alcohol supply.

Amendment No. 1 to Order M-69 requires distillers to deliver specified quantities to rectifying plants for redistillation into 190 proof alcohol.

Each producer also is required to report to the Chemicals Branch, War Production Board, the quantity of high wine his distillery is capable of producing and his entire storage facilities.

Magnesium

April 25, 1942. War Production Board extends order M-2-b.

Oiticica Oil

April 17, 1942. Oiticica oil, derived from a nut grown in Brazil, has been made subject to the terms of Order M-57, which controls tung oil, by action of the Director of Industry Operations. Oiticica oil is a substitute for tung oil.

The amended order restricts the use of either oil, any combination of them, or a mixture of either with other oils, to: War orders with ratings of A-2 or higher; Orders placed by the Defense Supplies Corporation: orders for the manufacture of linings or coatings for cans used in food processing.

Nickel

April 22, 1942. WPB issues Supplementary Order M-6-C requiring segregation of scrap containing more than one-half of one percent nickel by weight and permits its melting only for authorized uses.

Rayon

April 18, 1942. A regulation extending maximum prices to cover more than 90 percent of all rayon "grey" goods, and at the same time adjusting prices already under ceilings so as to correct a serious shift in production away from types of goods needed by clothing manufacturers and consumers, was issued today by Price Administrator Leon Henderson.

Revised Price Schedule No. 23 as amended supersedes the former price schedule bearing the same number and becomes effective April 21, 1942. It readjusts the maximum prices for a majority of the 52 constructions of rayon "grey" goods covered by the original order and extends the ceiling to take in 177 additional cloths at lower than present market levels.

Resins

April 15, 1942. The use of natural resins is limited by Conservation Order M-56. In the main, it restricts the use of natural resins in any calendar quarter to 50 percent of the amount used in the corresponding quarter of 1941.

Rotenone

April 13, 1942. Conservation Order M-133 issued to conserve supply and direct distribution.

Rubber

April 11, 1942. WPB issues amendments to M-15-b prohibiting manufacture of blowout shoes and restricting manufacture of reliners. Specifications governing use of rubber as insulation on neutral electrical wires effective May 1.

April 27, 1942. Use of scrap and reclaimed rubber during May in a specific list of articles will continue to be limited to 60 percent of a formula based on average monthly use over a base period, WPB announces.

It was ordered on March 20 that after May 1, products on list F of rubber order M-15-b could be made only with the prior approval of the Director of Industry Operations. Since information on which specific allotments could be based has not yet been developed, this date has been postponed to June 1 by Amendment No. 9.

List F includes automotive parts, fan belts, business machine rolls, parts for motor-driven electrical apparatus, and certain other items generally used in industry.

April 29, 1942. All rubber substitutes of the general type of Koroseal and Vinylite have been made subject to direct allocation by the War Production Board by Amendment No. 2 to General Preference Order M-10.

The order as originally issued in June, 1941, and as amended last December, included only polymerized vinyl chloride and its co-polymer with vinyl acetate, containing 92 percent or more of vinyl chloride. Today's amendment brings under the restriction all co-polymers of polyvinyl chloride.

Shellac

April 14, 1942. WPB issues Conservation Order M-106 reduces output of phonograph records and radio transcriptions to approximately 30 percent of 1941 production by limiting amount of shellac; freezes 50 percent of all inventories of shellac of 10,000 lbs. or more and 50% of all future imports.

Sulfur

April 18, 1942. Consumers of sulfur were urged today by the War Production Board to build up reserve supplies at their plants so possible transportation tieups in the future will not halt their operations.

The Director of Industry Operations has issued General Inventory Order M-132 to make such stockpiling possible. The Order relaxes Priorities Regulation No. 1 to permit deliveries of sulfur in excess of a practical minimum working inventory. Under M-132, no restrictions are placed upon deliveries or acceptances of sulfur from a primary producer.

Tin

April 10, 1942. WPB issues Amendment No. 2 to Order M-43. Restricts all persons except retailers from selling any solder with tin content of more than 16%, any tin bearing babbit metal or tin oxide with certain exceptions. Removes limitations on uses of tin for manufacture of implements of war.

April 23, 1942. Amendment No. 1 to Order M-104 further restricts manufacture of crown caps for bottles.

April 25, 1942. Amendment No. 1 repealed and amendment No. 2 issued to permit production of crown caps to the extent that cork is available until May 1, after which date such production is to end.

Vitamin A

April 10, 1942. L-40 as amended permits unrestricted use in foods of vitamin A oils blended prior to February 10.

Zinc Oxide

April 21, 1942. Price structure of zinc oxides clarified by OPA.

U. S. Chemical Patents

Off. Gaz.—Vol. 535, No. 4; Vol. 536, Nos. 1, 2—p. 336

A Complete Check—List of Products, Chemicals, Process Industries

Petroleum*

Polymerization procedure comprising in combination the steps of mixing a diolefin and a refrigerant at a temperature between —50°C. and —150°C., adding thereto a Friedel Crafts type catalyst and then within a time interval of 5 minutes, adding to the mixture of diolefin, refrigerant and catalyst, a portion of isoolefin, and conducting the polymerization of the mixed olefins to yield an interpolymer. No. 2,273,158. Robert Thomas and Donald Field to Standard Oil Development Co. a corp. of Del.

Process which comprises contacting a C_5 paraffinic hydrocarbon composition containing more than 10% of normal pentane with at least 100% by weight of aluminum chloride based on the total hydrocarbons present in the isomerization reactor at any one time in the presence of at least one hydrogen halide, vigorously agitating the reaction mixture maintained at a temperature of at least 30° F. while maintaining the temperature sufficiently low to insure liquid phase operation for a period of time sufficient to effect at least a 60% by volume yield of isopentane based on the normal pentane charged. No. 2,273,159. Carl Tongberg, Charles Lynch and Jeffrey Bartlett to Standard Oil Development Co. a corp. of Del.

Process for breaking petroleum emulsions of the water-in-oil type. No. 2,273,181. Melvin De Groote and Bernhard Keiser to Petrolite Corp. Ltd.

Process improving quality of straight run and cracked gasoline stocks containing organic sulfur impurities. No. 2,273,224. Walter Schulze to Phillips Petroleum Co.

Method rendering oil fractions containing sour sulfur compounds sweet to doctor test which comprises contacting oil to be treated with oil soluble lead naphthenate and with added reagent sulfur in absence of water, and at normal atmospheric temperature, and removing from oil the lead sulfide formed by reaction. No. 2,273,263. John Happel, Jr. and Donald Warren to Socony-Vacuum Oil Co.

Process for treating hydrocarbon oils to produce therefrom motor fuel substantially free of sulfur. No. 2,273,298. Antoni Szayna to Albert C. Travis.

Process desulfurizing sulfur-bearing hydrocarbon oils. No. 2,273,299 Antoni Szayna to Albert C. Travis.

In stabilization of olefinic gasoline by addition of gum inhibitors thereto, the method of increasing effectiveness of inhibitor which comprises incorporating into gasoline in addition to the gum inhibitor a condensation product of an aliphatic aldehyde with ammonia, the quantity of said product being insufficient in absence of said inhibitor to effect any appreciable gum inhibition of gasoline. No. 2,273,312. Joseph A. Chenicek to Universal Oil Products Co.

Process producing higher molecular weight monoolefin hydrocarbon from lower molecular weight olefin hydrocarbon and cycloparaffin. No. 2,273,320. Vladimir N. Ipatieff and Aristid V. Grosse to Universal Oil Products Co.

Process producing catalytic material comprises mixing solutions of sodium aluminate and ammonium chloride to precipitate hydrated aluminum oxide and combining with the aluminum oxide a hydrocarbon dehydrogenating catalyst comprising an oxide of an element from the left-hand columns of groups 4, 5 and 6 of the periodic table. No. 2,273,338. Charles L. Thomas to Universal Oil Products Co.

Method conducting cyclic process including dehydrating inhibited gasolines to remove dissolved water therefrom. No. 2,273,350. Walter C. Fry and Harold L. Bedell to Socony-Vacuum Oil Co.

Method recovering hydrocarbons. No. 2,273,412. Gerald W. McCullough to Phillips Petroleum Co.

Process of refining by selective solvent action. No. 2,273,660. John W. Poole.

Process refining a mineral oil containing desirable lubricating oil by selective solvent action of suitable solvents substantially liquid at usual atmospheric conditions. No. 2,273,661. John W. Poole.

Method for finishing of petrolatum stocks to produce brilliant, clear petrolatums. No. 2,273,726. David F. Renshaw to Socony-Vacuum Oil Co.

Resins, Plastics*

Process producing resinous products which comprises interacting phosphorus pentoxide with organic polyhydroxy compounds in proportion corresponding to at least 2 hydroxy groups but not substantially more than 3 hydroxy-groups per each molecule of phosphorus pentoxide, in which process compounds having tertiary alcoholic groups are excluded. No. 2,272,668. Herbert Honel to Reichhold Chemicals, Inc.

Heat-hardenable molding composition comprising an intimate mixture of ingredients comprising acid-hydrolyzed wood, at least 10% by weight thereof of a potentially heat-hardenable phenolaldehyde resin and, in addition, aniline. No. 2,272,742. Edmund F. Fiedler to General Electric Co.

Transparent, homogenous optical resin formed of a polymerized substance comprising a polymerizable unsaturated mono-methylene compound polymerized in the presence of triphenyl benzene which is fully dissolved in the polymer. No. 2,272,827. Carl Barnes to E. I. du Pont de Nemours & Co.

An organic plastics external mold lubricant comprising a di-substituted ester of phosphoric acid with an aliphatic alcohol containing 12-18 carbon atoms, inclusive. No. 2,272,847. Maurice Macht to E. I. du Pont de Nemours & Co.

Method of preparing a resin which comprises reacting about 100 parts of soft vulcanized rubber with about 10 to about 100 parts of a reagent consisting of an acyl halide, the said method comprising forming a mixture of the soft vulcanized rubber and the acyl halide, and then heating the mixture. No. 2,272,888. Frederick Kilbourne, Jr. to The Firestone Tire & Rubber Co.

Method of plasticizing polymerized styrene that consists in mixing therewith between 4% and 20% of phenanthrene. No. 2,272,996. Arthur Warner and Archibald New International Standard Electric Corp.

Process preparing a stable polyvinyl acetal resin which comprises condensing an aldehyde with a hydrolyzed polyvinyl ester in contact with polyhydroxybenzene in an amount between approximately 2% and approximately 6%, based on the weight of the polyvinyl ester. No. 2,273,035. Joseph Hale to Eastman Kodak Co.

Process preparing a polyvinyl formal resin molding powder which comprises atomizing a solution of said resin in acetic acid and allowing the atomized solution to fall into a bath of aqueous ammonia whereby said acetic acid is neutralized and said resin is precipitated in finely divided form. No. 2,273,140. Archibald Renfrew to Imperial Chemical Industries Ltd.

Method making insulating material that includes foaming slurry comprising a calcium sulfate as foam-stabilizing agent, and an aqueous solution of formaldehyde-urea reaction product. No. 2,273,367. Leonard S. Meyer to Plaskon Co., Inc.

Intermediate reaction product of formaldehyde with substance selected from group consisting of 1-R-2, 4-diimino-1, 2, 3, 4-tetrahydro, 1, 3, 5-triazines and 1-R-2-immino-4-amino-1, 2-dihydro-1, 3, 5-triazines in which R is a radical selected from group consisting of alkyl-phenyl alkoxy-phenyl, halo-phenyl and unsubstituted phenyl capable of conversion by heat into an infusible resin in presence of an acid. No. 2,273,382. John K. Simons to Plaskon Co., Inc.

Composition of matter comprising a halogen containing film-forming plastic material selected from group comprising chlorinated rubber, polyvinyl chloride, and chlorobutadiene, and an acetal of compound of type formula aryl . X . alkyl . OH . wherein X stands for a member of the group consisting of O and S as a plasticizer therefor. No. 2,273,436. Kurt Desamari and Reinhard Hebermehl to I. G. Farbenindustrie Aktiengesellschaft.

New article of manufacture for use as a material for forming a container comprising the combination of a sheet of paper, a layer of solvent-free thermoplastic resinous varnish superimposed thereupon and bonded thereto by bond formed there-between in presence of a solvent and an exposed superimposed performed sheet-like thermoplastic medium mounted on the solvent-free surface of said thermoplastic medium being bonded to the solvent-free varnish layer by a bond formed therebetween under the action of heat but in the absence of solvent. No. 2,273,560. William C. Calvert to Wingfoot Corp.

Process for preparation of synthetic resinous products consisting in simultaneously treating rubber with maleic anhydride and a phenol at about the boiling point of phenol. No. 2,273,593. Cyril A. Redfarn and Philip Schidrowitz to The British Rubber Producers Research Assoc.

Process forming a mirror on an article made of methacrylate resin which comprises treating surface of said article for period of time of the order of from 12 to 48 hours with a concentrated solution of an alkali hydroxide until the surface is receptive to silver, subjecting the surface to action of a mixture of a silvering solution and a reducing solution, draining the spent solution and repeating the silvering operation until a continuous film of paper thickness has been deposited. No. 2,273,613. Willare F. Bartoe to Rohme & Haas Co.

Polyvinyl chloride solution and method of making same. No. 2,273,682. Ralph F. Wolf to The B. F. Goodrich Co.

Condensation product formed by condensation reaction with formaldehyde of a mixture of an unsubstituted urea and a urea substituted by an alkyl radical containing at least four carbon atoms, said unsubstituted urea being present in condensation reaction in an amount sufficient to permit the final product to be hardened by the application of heat, and said higher alkyl substituted urea being present in the condensation reaction in an amount sufficient to enable the final product to be dissolved in organic solvents. No. 2,273,788. John F. Olin to Sharples Chemicals, Inc.

Rubber*

Method manufacturing rubber tubing in continuous lengths. No. 2,272,343. John A. Kelly to Davol Rubber Co.

Vulcanized addition compound of rubber and organic antiseptic which has a thiohalide group having a phenolic hydroxy group, said compound having a surface antiseptic effect when in contact with body emissions. No. 2,272,396. Harold Becher, John Ross and Jacob Stein to Antiseptics, Inc.

Antiseptic rubber containing absorbed and condensed vapor of oxyquinoline, said condensed vapor being in rubber in sufficient proportion and being sufficiently rapidly releasable from the rubber at ordinary body temperature to produce a surface antiseptic and non-toxic effect when antiseptic rubber contacts with body emissions. No. 2,272,397. Harold Becher, Albert S. Keston and Jacob Stein to Antiseptics, Inc.

A reaction product capable of developing antiseptic or therapeutic properties upon contact with body emissions comprising rubber, an antiseptic and a substance selected from the group consisting of acids and bases, said product being capable of being decomposed by contact with body emissions to liberate the antiseptic from the product and leave a rubber residue having a pH value different from the product prior to decomposition and other than seven. No. 2,272,398. Harold Becher, Jacob Stein and John Ross to Antiseptics, Inc.

In art making vulcanized rubber for use in contact with body emissions and which contains an antiseptic which is releasable from said vulcanized rubber to produce an antiseptic and non-toxic effect when said vulcanized rubber contacts with body emissions, the step which consists in incorporating said antiseptic into rubber subsequent to vulcanization of the rubber and in suitable proportion to produce said effect. No. 2,272,399. Harold Becher, Jacob Stein and John Ross to Antiseptics, Inc.

Composition rubber compounded with substantial proportion of low-polymer coumarone-indene resin initially fluid at normal room temperature oxidized by blowing it with oxygen-containing gas to state of gum solid at normal room temperature. No. 2,272,600. Frank W. Corkery to Pennsylvania Industrial Chemical Corp.

* *Cont'd. from last month, Volume 535 Nos. 2, 3.*

U. S. Chemical Patents
Off. Gaz.—Vol. 535, No. 4; Vol. 536, Nos. 1, 2—p. 336

U. S. Chemical Patents

Off. Gaz.—Vol. 535, No. 4; Vol. 536, Nos. 1, 2—p. 337

Method forming a rubber thread. No. 2,272,880. Harold Greenup to The Firestone Tire & Rubber Co.

Process vulcanizing rubber in presence of active accelerator of vulcanization of acidic type and as an activator therefor a primary 2-amino thiazole. No. 2,271,782. Arthur W. Sloan to The B. F. Goodrich Rubber Co.

Method identifying and tracing organic textile fabrics throughout the dyeing operations thereon. No. 2,272,229. Jesse Le Roy Tucker to Owens-Corning Fiberglas Corp.

Apparatus for producing a multifilament rubber thread. No. 2,273,082. Lucius Aldrich to United States Rubber Co.

Amino Azyl polysulfides and method of making. No. 2,273,321. Paul C. Jones to The B. F. Goodrich Rubber Co.

Organic vulcanizing agent. No. 2,273,322. Paul C. Jones to B. F. Goodrich Co.

Accelerator of vulcanization. No. 2,273,323. Paul C. Jones to B. F. Goodrich Co.

Accelerator of vulcanization. No. 2,273,324. Paul C. Jones to B. F. Goodrich Co.

Improvement in production of filaments from rubber hydrochloride film produced by stretching and rolling or twisting the film which comprises coating at least a portion of film with abrasive before twisting or rolling same. No. 2,273,364. Gerald D. Mallory to Wingfoot Corp.

Process manufacturing synthetic rubber comprising converting furfurol into methylfurane, converting the methyl furane into tetrahydomethylfurane converting the tetrahydromethyl furane into piperylene, and finally converting the piperylene into synthetic rubber. No. 2,273,484. Henry M. Emmanuel Guinot to Les Usines de Melle.

Reclaiming of vulcanized rubber scrap selected from group consisting of natural rubber, polymeric butadiene-1.3 hydrocarbons and copolymerizates of butadiene-1.3 hydrocarbons with other copolymerizable compounds by heating same for from about 10 to about 20 hours in presence of solvent to a temperature of from about 100 to about 140° C. while bubbling an oxygen-containing gas through the mixture and in presence of monoarylhydrazine. No. 2,273,506. Otto Bachle to General Aniline & Film Corp.

Textiles*

Apparatus for diminishing yarn denier differences in the production of artificial yarn from filament-forming material. No. 2,273,106. Winfield Heckert to E. I. du Pont de Nemours & Co.

Process improving spinning property of a filament-forming spinnerette which comprises coating the same with a lubricant to prevent fouling of spinnerette orifices said lubricant composed of a polymer of an unsaturated hydrocarbon material. No. 2,273,638. George D. Graves and Warner J. Merrill to E. I. du Pont de Nemours & Co.

The following patents are from Off. Gaz.—Vol. 535, No. 4 and Vol. 536, No. 1.

Cellulose

Softened regenerated cellulose article containing an amino-iminomethane sulfoxylic acid color stabilizing agent. No. 2,273,890. Franklin Traviss Peters to E. I. du Pont de Nemours & Co.

Treating cellulosic materials. No. 2,274,363. Robinson Percy Foulds and William H. Roscoe to Tootal Broadhurst Lee Co., Ltd.

Preparation of alkali cellulose. No. 2,274,463. Johann J. Stoeckley and Richard Bartunek to North American Rayon Corp.

Cellulose derivative compositions. No. 2,274,568. Bryon M. Vanderbilt to Commercial Solvents Corp.

Transparent flexible crease-resisting and odorless article of manufacture comprising sheet of cellulose hydrate as base, coated with plurality of layers of different compositions, one composition consisting of chlorinated rubber and chlorinated paraffin, and the other composition selected from group consisting of cellulose esters, said layers bonded to one another and in turn forming a substantially uniform sheet. No. 2,275,289. Emil Czapek to Guaranty Trust Co. of New York.

In method of toughening non-fibrous, cellulosic sheets and films cast from aqueous alkaline cellulosic solutions, the steps which comprise passing said films through a bath containing a softening agent, preliminary drying the same to a point at which they contain between 100% and 200% moisture based on the weight of the cellulosic material with substantially complete elimination of tension and completing the drying of said films under tension. No. 2,275,347. William H. Charch and Francis P. Alles to E. I. du Pont de Nemours & Co.

Method producing non-fibrous cellulosic sheets and films from aqueous alkaline cellulosic solutions. No. 2,275,348. William H. Charch and Francis P. Alles to E. I. du Pont de Nemours & Co.

Ceramics, Refractories

Process of making a ceramic article from plastic clay. No. 2,273,859. Robert E. Gould.

Fine-grained, dense ceramic insulating material consisting of upwards of 90% sintered alumina, from .7% to 1.40% CaO, from 1/3 to 1½ times as much MgO as there is CaO and any remainder consisting chiefly of silica. No. 2,274,067. Joseph A. Jeffery to Champion Spark Plug Co.

In manufacture of mortar or mass concrete from hydraulic cement produced by a burning reaction and aggregate the steps which comprise aqueously extracting from the cement water-soluble alkali compounds separating the cement from the aqueous extracting medium, and thereafter mixing the cement with the aggregate. No. 2,274,936. Carl Pontoppidan to F. L. Smidth & Co.

Opacifying agent for enamels which comprises a mixture of one part of cerium dioxide and 6 parts of alkalized clay, said alkalized clay having been prepared by mixing enamel clay with an alkaline solution or suspension of an alkalizing agent selected from group which consists of sodium hydroxide, potassium hydroxide, potassium hydroxide, potassium carbonate, ammonia and barium hydroxide, and then drying said mixture. No. 2,275,261. Walter Kerstan to Deutsche Gold-und Silber-Scheideanstalt.

* *Cont'd. from last month, Volume 535 Nos. 2, 3.*

Chemical Specialty

Method of preserving a fresh animal casing which comprises preliminarily treating it with an alkaline buffering material, drying the casing and storing the dried casing in the absence of preservative materials. No. 2,273,810. Nicholas M. Adams to Wilson & Co. Inc.

Insect repellent composition which consists of an inert diluent and repellent; said repellent consisting of at least one ester of a saturated aliphatic acid of the group consisting of a dicarboxylic acid having six carbon atoms to the molecule, a hydroxy dicarboxylic acid and a hydroxy monocarboxylic acid, said ester having at least six and not more than fifteen carbon atoms to the molecule, and the ester of said hydroxy monocarboxylic acid having an oxygen atom in ether linkage in the alcohol radical thereof when said alcohol radical contains not more than five carbon atoms. No. 2,273,860. Philip Granett to National Carbon Co., Inc.

Transparent surgical wound dressing covering comprising a freely flexible, transparent non-porous tape provided on both faces thereof with transparent, pressure-sensitive adhesive coatings. No. 2,273,873. Edward F. Klein to Raritan Bay Holding Co.

Moistureproof sheet wrapping material. No. 2,273,880. James A. Mitchell to E. I. du Pont de Nemours & Co.

Pencil lead presenting a porous structure impregnated with a fatty acid of the oleic acid series, and the mark of which has a predetermined low electrical resistance. No. 2,273,935. Isidor Chesler to Eagle Pencil Co. Inc.

Insect repellent composition which contains one of the group consisting of dibutyl 1-malate, diethyl d1-malate, benzyl lactate, and tetrahydrofurfuryl lactate. No. 2,274,267. Philip Granett to National Carbon Co., Inc.

Method of and apparatus for manufacturing confectionery products. No. 2,274,464. Norman M. Thomas to Joe Lowe Corp.

Insecticide and moth larvae repellent. No. 2,274,476. Ingenuin Hechenbleikner to American Cyanamid Co.

Soap composition. No. 2,274,584. Hans Beller and John J. Owen to Jasco Inc.

Gypsum plaster composition adapted to use in building blocks, bricks, walls and ceiling fabrication comprising uniformly sized coarse lumps of calcined gypsum which have been rehydrated while maintaining the relative positions of the said lumps substantially constant. No. 2,274,705. Lewis C. Karrick.

Fusible printing ink being solid at ordinary atmospheric temperatures comprising a pigment, sulfur and a plasticizer therefor consisting of a synthetic resin made by interaction of sulfur monochloride and cresylic acid said ink being adapted while hot for printing on surfaces and drying and hardening of said ink being attained solely by cooling to atmospheric temperature. No. 2,275,101. Carleton Ellis to Ellis Laboratories, Inc.

Glue suitable for gluing wood veneers having an acid reaction at least during the development period of the glue bond. No. 2,275,314. Gordon G. Pierson to Perkins Glue Co.

Composition flooring tile comprising as a binder rosin glyceride and a reaction product of castor oil and a tung oil-maleic acid compound. No. 2,275,376. Carleton Ellis to Ellis-Foster Co.

Coal Tar Chemicals

Addition products of amides of low molecular carboxylic acids and process of producing the same. No. 2,273,940. Hermann Dimroth and Hans Haussmann to General Aniline & Film Corp.

Process of sulfonating aromatic carboxylic acid chlorides which comprises treating under sulfonating conditions aromatic carboxylic acid chlorides of the benzene series with sulfuric anhydride in quantities not exceeding 150% of the theoretically required quantity. No. 2,273,974. Wilhelm Meiser to General Aniline and Film Corp.

Substituted aryl amides of pyridine carboxylic acid. No. 2,274,620. Lester J. Szabo to S. M. A. Corp.

Organic hexamethine compound. No. 2,275,024. Walter Zeh to General Aniline & Film Corp.

Para-aminobenzene-sulfonamide pyridine compounds of the formula: Z-R-So_2-Y: in which X is a radical of the class of amino groups, Y is the radical of an amino-pyridine the amino group of which is linked to the -SO_2-group and the R is a phenylene radical. No. 2,275,354. Arthur J. Ewins and Montague A. Phillips to May & Baker, Ltd.

A polyalkylene ether disulfonyl halide. No. 2,275,378. Treat B. Johnson to Rohn & Haas Co.

Polyalkylene ether disulfonyl amides and process which comprises reacting thiourea with a chlorinated polyalkylene ether and subjecting the pseudothiourea compound to the action of a halogen in the presence of water, then reacting the sulfonyl halide obtained with ammonia. No. 2,275,379. Treat B. Johnson to Rohn & Haas Co.

Alkyl ester of 4-methyl-Δ 4-tetrahydrophthalic acid. No. 2,275,383. Frank J. Soday to The United Gas Improvement Co.

Composition comprising a cellulosic derivative and dibutyl ester of 40 methyl-Δ 4-tetrahydrophthalic acid. No. 2,275,384. Frank J. Soday to The United Gas Improvement Co.

An alkyl ester of 3-methyl-Δ 4-tetrahydrophthalic acid. No. 2,275,385. Frank J. Soday to The United Gas Improvement Co.

Process for preparation of organic ester comprising reacting 3-methyl-Δ 4-tetrahydrophthalic acid with an amyl alcohol. No. 2,275,386. Frank J. Soday to The United Gas Improvement Co.

Dyes, Stains

Azo dye. No. 2,274,387. Francis H. Smith to E. I. du Pont de Nemours & Co.

Azo derivatives of carboxylic acid amides and method of making. No. 2,274,717. Chauncey A. Lyford to Allied Chemical & Dye Corp.

Azo dye. No. 2,275,124. Frithjof Zwilgmeyer to E. I. du Pont de Nemours & Co.

Diazo dyestuffs. No. 2,275,130. Wilfrid H. Cliffe, Arnold Kershaw and A. H. Knight to Imperial Chemical Industries, Ltd.

U. S. Chemical Patents

Off. Gaz.—Vol. 535, No. 4; Vol. 536, Nos. 1, 2—p. 338

Equipment, Apparatus

Apparatus for catalysis and the use thereof. No. 2,273,865. Eugene J. Houdry to Houdry Process Corp.

Recovery retort for mercury and the like. No. 2,273,929. William Brotherton to Elizabeth M. Price.

Machine for recovering carbon. No. 2,274,320. Edward O. Coats to The Do-All Products Co., Inc.

Apparatus treating and refining molten metals comprising a treating kettle, a stirrer extending into the lower section of the kettle, mechanical driving means provided at the free end of the stirrer, a conical hood structure forming a kettle sealing working and stirrer supporting unit consisting of a kettle supported multi-arm spider, at least one vertically adjustable mixing baffle fastened to said hood structure and extending into the upper zone of the kettle and a plurality of individual removable hood sections supported by said spider arms. No. 2,275,266. Max Meyer to Almac Metal Corp.

Battery comprising an electrolyte, electrodes, one of said electrodes comprising a porous support, an electrically conductive highly activated carbon layer on said support, a water repellent, alkali resisting, highly substituted cellulose ether binding said layer to said support and serving as an anti-wetting agent, and means for supplying an oxygen containing gas under pressure to the surface of contact between the electrolyte and said layer. No. 2,275,281. Ernst Berl.

Explosives

Manufacture of styphnic acid salts. No. 2,275,169 to 2,275,173. Willi Brun to Remington Arms Co., Inc.

Fine Chemicals

Process for making isochlorophyl-lin-a-sodium and the product thereof. No. 2,274,102. Eric G. Snyder to Jovan Labs., Inc.

Chromones and process for producing same. No. 2,274,449. Walter J. Gottingen and Philipp Gunther to Merck & Co.

Glucamine salts of amino-phenyl stibonic acid. No. 2,274,593. Robert L. Despois to Societe des Usines Chimiques.

Protein composition of improved water resistance when dry comprising an aqueous alkali solution of vegetable protein formaldehyde a drying oil dispersed therein and glycerine in an amount up to 125% by weight of the protein sufficient to increase the water resistance of said composition when dry. No. 2,274,695. Albert J. Herberger and Clarence H. Phillips to The Glidden Co.

Product for use in preventing sunburn of the human skin when exposed to sun rays, but permitting the passage of wave bands having a beneficial effect upon human skin, comprising a preparation containing a substantial amount of a non-irritating vehicle carrying hydroquinone and minor portion of an anti-oxidant of group consisting of metabisulfites of alkali metals and alkaline earth metals, said preparation being adapted to be spread upon the human skin and being non-irritating to the skin, the anti-oxidant being present in an amount sufficient to give the preparation a pH value under 7, said preparation being stable and retaining substantially its normal color over long periods of time. No. 2,274,725. David O. Meeker and Edward E. Henderson to Scherine Corp.

Light-sensitive photographic material. No. 2,274,782. Bela Gaspar to Chromogen, Inc.

Dextrine. Continuous process for production. No. 2,274,789. Anthony C. Horesi to Corn Products Refining Co.

Esters of 4-cyclohenene-1, 2-dicarboxylic acid. No. 2,275,034. Clarence L. Moyle to The Dow Chemical Co.

Industrial Chemicals

Parasiticidal materials corresponding to the general formula

$$(RO)_n—(alk—NY)m—CO—Z(X)_w$$

wherein R is an organic radical containing at least four carbon atoms, alk is a member selected from the group consisting of alkylene and arylene and substitution products thereof, Z is a member selected from the class consisting of hydrocarbon radicals and substitution products thereof, Y is a member selected from the group cinsisting of hydrogen, alkyl, cycloalkyl, alkoxyl, aralkyl, aryl, and alkylol, n, m and w are small whole numbers, and X is halogen. No. 2,273,849. Albert K. Epstein and Benjamin R. Harris.

Double silicates of zirconium and method of making same. No. 871. Charles J. Kinzie to The Titanium Alloy Mfg. Co.

Doubles silicates of zirconium and method of making same. No. 2,273,872. Charles J. Kinzie to The Titanium Alloy Mfg. Co.

Method of polymerizing polymerizable materials containing more than one polymerizable grouping. No. 2,273,891. Maxwell A. Pollack, Irving E. Muskat and Franklin Strain to Pittsburgh Plate Glass Co.

Oxides of substituted phenothioxins. No. 2,273,905. Frank B. Smith and Harold W. Moll to The Dow Chemical Co.

Trifluoromethyl-naphthalene and process for preparing which comprises reacting naphthalene with carbon tetrachloride and anhydrous hydrogen fluoride in the presence of copper. No. 2,273,922. Anthony F. Benning and Hans B. Gottlieb to E. I. du Pont de Nemours & Co.

Method of separating a constant boiling mixture of acetone and cyclic ether, the ether having a higher boiling point than the acetone into its components. No. 2,273,923. Joseph E. Bludworth to Celanese Corp. of America.

Process making aluminum sulfate by the treatment of an aluminum ore with sulfuric acid. No. 2,273,930. Robert L. Brown to Hercules Powder Co.

Process preparing 1-amino-5-nitroanthraquinone which comprises reacting 1, 5-dinitroanthraquinone with dimethyl aniline in a phenolic solvent and in the presence of sulfuric acid, the dimethyl aniline being added slowly to prevent an undue liberation of heat, the reduction being stopped immediately upon disappearance of the 1, 5-dinitroanthraquinone from the suspension. No. 2,273,966. Daxid X Klein to E. I. du Pont de Nemours & Co.

Analysis of gases. No. 2,273,981. John D. Morgan and Alan P. Sullivan to Cities Service Oil Co.

Method of treating corn gluten having not over 45 parts of starch to about 55 parts of protein which comprises subjecting the gluten to the action of acid in an aqueous mass of pH from 0 to 2 to solubilize all the starch content of the gluten without dissolving or destroying the protein character of the resulting gluten and to increase the solubility of the protein content in alkaline solutions separating solid protein from the liquid vehicle containing the solubilized starch, and recover the protein. No. 2,274,004. Paul R. Shildneck to Prolamine Products, Inc.

Process for oxidizing organic materials to form oxygenated organic compounds therefrom. No. 2,274,057. Robert A. Gerlicher to Standard Oil Development Co.

An ammonium metallonitrite having at least one alkyl group of at least 8 carbon atoms. No. 2,274,058. Max T. Goebel and Isaac F. Walker to E. I. du Pont de Nemours & Co.

Volatile aliphatic esters, process for manufacturing. No. 2,274,061. Charles W. Hawley to E. I. du Pont de Nemours & Co.

Preparation of carbon monoxide-hydrogen gas mixtures for hydrogenation. No. 2,274,064. Frank A. Howard and Edward B. Peck to Standard Catalytic Co.

Process for curing vanilla beans. No. 2,274,120. Arnold K. Balls and Arthur G. Kevorkian and Francisca E. Arana to the free use of the People of the U. S.

Steps of improving luminescent material which comprises adding the luminescent material to be improved to a solution of a silicate salt, and thereafter precipitating silica out of said solution upon the added luminescent material. No. 2,274,163. Ronald Puleston and Stanley T. Henderson to Electric & Musical Industries, Ltd.

Dry stable solid composition comprising sulfamic acid and an inorganic salt soluble in acid solution with evolution of a gas. No. 2,274,252. Arthur P. Tanberg to E. I. du Pont de Nemours & Co.

In process manufacturing luminescent materials of the silicate type, the step of adding silica in excess of the quantity required to give stoichiometric proportions. No. 2,274,272. Humboldt W. Leverenz to Radio Corp. of America.

In method of treating an earth or rock formation, the step which consists in introducing into the formation a resin-forming liquid capable of transformation into a solid resin. No. 2,274,297. Carroll Irons and Sylvia M. Stoesse to The Dow Chemical Co.

Olefin polymerization. No. 2,274,328. Henri M. Guinot to Les Usines de Melle.

Production of butadiene. No. 2,274,358. Adolf Cantzler and Hans Krekeler to Jasco Inc.

Hydrogen absorber. No. 2,274,388. Emerson Venable to Westinghouse Electric and Mfg. Co.

Method of preparing free aliphatic bases. No. 2,274,412. William H. Hill to American Cyanamid Co.

Method of making calcium thiocyanate. No. 2,274,456. John L. Osborn to American Cyanamid Co.

Alkoxy alkylol cyanamide compound. No. 2,274,474. Walter P. Ericks to American Cyanamid Co.

Wax dispersion and method of preparing same. No. 2,274,509. Henry C. Thompson.

Method for the separation of chemically modified rosin alcohols into components. No. 2,274,523-524. Joseph N. Borglin to Hercules Powder Co.

Production of chloroisoprene. No. 2,274,611. Charles D. Hurd to Commercial Solvents Corp.

Process for preparation of improved synthetic fatty acids comprising heating an aqueous solution of soaps of crude synthetic fatty acids with about 0.5 to 3.0% by weight of a hydrosulfite until the color of the solution is substantially reduced, then acidifying the solution with a dilute mineral acid and separating improved synthetic fatty acids of light color therefrom. No. 2,274,632. John J. Owen to Standard Oil Development Co.

Production of hydrocarbons with more than one carbon atom in the molecule by conversion of carbon monoxide with hydrogen in the presence of cobalt containing catalysts comprising working in the presence of cobalt containing catalysts, in the preparation of which a reducible cobalt compound is gradually precipitated from a solution of a cobalt salt during a period of at least 3 hours. No. 2,274,639. Arno Scheuermann and Arnold Kotzschmar to Standard Catalytic Co.

Process refining tobacco which comprises subjecting the tobacco to the action of hydrogen peroxide and subsequently contacting said tobacco with a decomposition catalyst for decomposing hydrogen peroxide in order to destroy hydrogen peroxide remaining undecomposed on said tobacco. No. 2,274,649. Hermann Baier to Deutsche Gold Und Silber Scheideanstalt.

Laminated plate comprising a pair of glass sheets adhered to the opposite sides of a sheet of polymerized incomplete vinyl acetal resin containing approximately 32% by weight of tri ethylene glycol dioctoate as a plasticizer. No. 2,274,672. Brook J. Dennison to Pittsburgh Plate Glass Co.

Member of group consisting of mono-arylamides of polycarboxylic acids of which the carboxyl groups are mutually joined by a carbon to carbon linkage containing a primary amino group and a sulfonamide group as nuclear substituents of the arylamine residue and water soluble salts thereof. No. 2,274,716. Chauncey A. Lyford to Allied Chemical & Dye Corp.

Process obtaining or separating volatile substances from hot or boiling solvents under pressure which comprises reducing the pressure on said solvent whereby a gaseous mixture containing at least some of the volatile substances is produced separating said gaseous mixture from the remaining liquid, rectifying the gaseous mixture to concentrate the volatile substances in said gaseous mixture condensing said gaseous mixture, each of the previously recited steps being performed at super-atmospheric pressure and utilizing the heat resulting from the condensing step for heating purposes. No. 2,274,748. Max Seidel.

Process continuously distilling at reduced pressure without use of added gaseous medium higher fatty acids from a material containing a substantial amount of higher free fatty acid and thereby separating said material into a component consisting of most of the free fatty acids in substantially pure form and a component consisting of undistilled residue. No. 2,274,801 and 2,274,802. Victor Mills to The Procter & Gamble Co.

Non-alkaline detergent comprising a water-soluble salt of primary straight-chain alkyl amine in which the alkyl group contains 10 to 18 carbon atoms. No. 2,274,807. Albert L. Rawlins and Leon A. Sweet to Parke, Davis & Co.

U. S. Chemical Patents
Off. Gaz.—Vol. 535, No. 4; Vol. 536, Nos. 1, 2—p. 338

U. S. Chemical Patents

Off. Gaz.—Vol. 535, No. 4; Vol. 536, Nos. 1, 2—p. 339

Inorganic nitrate containing a small amount of finely divided metal oxide and coated with a resin solid at room temperatures and having a drop melting point of less than 125°C., said oxide having substantially no action on said inorganic nitrate, and being reactive with said resin under the conditions of coating. No. 2,274,822. Robert W. Cairns and William M. Cobb, Jr., to Hercules Powder Co.

Composition comprising a polymerization product of a low molecular weight monohydric alcohol such polymerization product being substantially non-volatile at about 600°F. No. 2,274,864. Eugene Lieber and Marvin E. Thorner to Standard Oil Development Co.

In process of curing solid juice-containing vegetable feed materials, the step comprising mixing an amount of quicklime with said materials sufficient to dry up perceptible moisture and produce a dry non-spoiling feed. No. 2,274,905. Lawrence W. Lewis.

Method preparing soy bean protein to improve the same for use in adhesive coatings. No. 2,274,983. Russell H. Hieronymus to The Drackett Co.

In method of propagating poplars from cuttings the improvement which comprises immersing the cuttings in an aqueous medium containing a salt of phenylstearic acid, and planting the treated cuttings. No. 2,274,989. Ralph H. McKee to McKee Poplar Forestation, Inc.

Manufacture of phthalic acid-monophenyl-amides. No. 2,275,006. Jakob Bindler to J. R. Giegy A. G.

Amides acylated with acylating agents containing a water solubilizing group. No. 2,275,013. Charles Graenacher, Franz Ackermann and Heinrich Bruengger to Society of Chemical Industry in Basle.

Process which comprises incorporating into a water-soluble synthetic linear polyamide an insolubilizing agent comprising a compound having a methylene group attached only to elements selected from the groups V and VI of the periodic table and having an atomic weight of from 14 to 33 and then heating the polyamide containing said agent. No. 2,275,008. Donald D. Coffman to E. I. du Pont de Nemours & Co.

Manufacture of basic magnesium carbonate and heat insulation material comprising same. No. 2,275,032. Harold W. Greider and Roger A. MacArthur to The Philip Carey Manufacturing Co.

Mixed aromatic phosphates and method for preparing same. No. 2,275,041. Edgar C. Britton and Clarence L. Moyle to The Dow Chemical Co.

Preparation of phenol wherein an aryl halide is reacted with aqueous calcium hydroxide at a temperature substantially above the normal boiling point at the mixture and under a pressure substantially above atmospheric the steps which consist in holding the reaction mixture at said temperature and pressure while separating insoluble calcium hydroxide from the liquid mixture containing the free phenol, and separating the free phenol from said liquid mixture. No. 2,275,044. John J. Grebe to The Dow Chemical Co.

In method recovering a phenol from an aqueous solution of a calcium salt of the phenol, the steps which consist in heating the solution at a temperature substantially above its normal boiling point to hydrolyze the calcium salt of the phenol and holding the reaction mixture at said temperature under a pressure substantially above atmospheric pressure while separating insoluble calcium hydroxide from the liquid mixture containing the free phenol. No. 2,275,045. John J. Grebe to The Dow Chemical Co.

Electrolytic production of lead sulfo-chromates. No. 2,275,054. Stephen W. Stockdale and Elbert F. Weaver to International Smelting & Refining Co.

Process obtaining valuable products from tall oil which comprises subjecting crude tall oil to refining treatment at temperature near or below atmospheric with approximately 1 to 2% of hydrogen chloride by weight of the tall oil to form a granular readily filterable precipitate, filtering off the resultant precipitate and treating it with alcohol to selectively dissolve and separate coloring impurities from phytosterol contained therein, separating the solvent solution and treating the undissolved material to recover therefrom by crystallization purified phytosterol as a product of the process. No. 2,275,075. Frederick H. Gayer and Charles E. Fawkes to Continental Research Corp.

Process treating slurry which comprises maintaining a mass of relatively movable bodies, rotating said mass of bodies in a vertical plane at a speed such that the bodies move relative to one another during such rotation spreading slurry over said mass of bodies as it rotates, and passing gases through the rotating mass of bodies over which the slurry has been spread in a direction transverse to that in which the mass of bodies is rotating. No. 2,275,117. Mickael Vogel to F. L. Smidth & Co.

An N-cyclohexyl sulphamic acid. No. 2.275,125. Ludwig F. Audrieth and Michael Sveda to E. I. du Pont de Nemours & Co.

Process concentrating potassium chloride from a sylvinite ore by a flotation process which comprises using as a flotation reagent a material of the class consisting of acidic fractions of petroleum oxidation carboxylic acids in which acids having seven to 11 carbon atoms are concentrated and products resulting from at least the partial neutralization thereof. No. 2,275,138. Fritz E. Fuchs to Petrolite Corp., Ltd.

Process for separation of ethyl chloride from a mixture comprising ethyl chloride and butane comprising contacting said mixture with an alcohol separating the resulting phases and removing the alcohol therefrom. No. 2,275,151. Charles N. Kimberlin to Standard Oil Development Co.

Process of producing alcohols which comprises treating with hydrogen an anhydride of an aliphatic carboxylic acid containing more than 1 carbon atom per carboxyl group at a temperature in excess of 200°C. and under a pressure in excess of 10 atmospheres in the presence of copper oxide intimately associated with an oxide of chromium. No. 2,275,152. Wilbur A. Lazier to E. I. du Pont de Nemours & Co.

Method producing rounded particles organic material having cellular structure which comprises heating a polymeric organic thermoplastic material in the form of a powder containing a small percentage of a solvent for said material, at a temperature higher than the boiling point of said solvent while maintaining a pressure sufficiently low to cause the said solvent to boil at a temperature below that which would cause the particles of said thermoplastic material to coalesce whereby there is formed a plurality of separate expanded rounded particles. No. 2,275,164. Robert M. Thomas and William J. Sparks to Standard Oil Development Co.

Process of liquid purification which comprises simultaneously exchanging anions and cations by contacting the liquid with a solid amphoteric organic material of low solubility in water and having both anion and cation exchanging properties. No. 2,275,210. Oliver M. Urbain and William R. Stemen to Charles H. Lewis.

Process of liquid purification which comprises exchanging cations by contacting the liquid with a solid, water insoluble basic salt of a polybasic organic acid and an amphoteric metal said salt having cation exchanging properties. No. 2,275,211. Oliver M. Urbain and William R. Stemen to Charles H. Lewis.

Process treating slop produced in manufacture of alcohol containing distilled liquids which comprises electrolyzing whole slop at an elevated temperature below boiling at a pH of 3.6-7.0 by direct current of a density of at least 30 amperes per square foot of electrode surface to coagulate the solids therein, and collecting the said solids. No. 2,275,217. Charles J. Brockman.

Process treating hydrocarbons capable of thermal decomposition to form olefin hydrocarbons of lower molecular weight which comprises intimately mixing with said hydrocarbons a small proportion of oxygen at temperature insufficiently high to effect any reaction of said oxygen with said hydrocarbons and then rapidly heating resulting mixture in absence of halogens and halogen compounds to temperature effective to promote decomposition of said hydrocarbons in absence of said oxygen whereby the oxygen present in said mixture accelerates said decomposition to rate substantially greater than could be attained under similar conditions in the absence of said oxygen. No. 2,275,232. Francis O. Rice to Process Management Co., Inc.

Solution of cupric sulfate and zinc sulfate in glycerol mixed with a solution of silver nitrate in water the solution containing substantially equal parts of the metallic salts and adapted to be used in suitable graduated dilutions for application to the mucous membranes involved in nasal allergy and associated conditions. No. 2,275,292. Edward E. Edmondson.

Process of removing acidic gases such as hydrogen sulfite, carbon dioxide, and the like from gas mixtures. No. 2,275,294. Herbert A. Gollmar and Bernard J. C. van der Hoeven to Koppers Co.

Process for nuclear alkylation of amino phenols and product thereof. No. 2,275,311. Charles J. Pedersen and Viktor Weinmayr to E. I. du Pont de Nemours & Co.

In process of nuclear alkylation by condensing agent having an alkyl group containing at least three carbon atoms, the step which comprises condensing the reactants in the presence of anhydrous hydrofluoric acid as the effective catalyst. No. 2,275,312. John M. Tinker and Viktor Weinmayr to E. I. du Pont de Nemours & Co.

Process for recovery of phenols from gas and weak ammonia liquors containing acid-gas constituents. No. 2,275,399. Heinrich Koppers to Koppers Co.

Leather

An artificial leather which is resistant to spewing at high temperatures and retains its flexibility at low temperatures which consists of a flexible base web and a coating of a pigmented composition consisting of about 40 parts of nitrocellulose, about 30 parts of butyl acetyl ricinoleate and about 30 parts of a mixture of castor oil and polymerized rapeseed oil. No. 2,273,973. Robert C. Medl, Jr. to Hercules Powder Co.

Metals, Alloys

Light metal alloy containing 1 to 5% aluminum, 2 to 6% bismuth, 0.5 to 3% cadmium, from traces up to 7% zinc, from a small but effective amount to 5% silver, and a remainder substantially all of magnesium with customary additions and impurities. No. 2,273,831. Arthur Burkhardt and Richard Knabe to Georg Von Giesche's Erben.

Method of manufacturing molding powder which consists in providing a quantity of metal core particles of a given melting point and given size, and a relatively smaller quantity of other metal particles of relatively lower melting point and relatively much smaller size, mixing and moistening the particles whereby the core particles are given a uniform coating of adherent finer particles, and subjecting the so-treated core particles, in a reducing atmosphere, to heat sufficient and for a sufficient length of time to cause an incomplete diffusion of the fine particles into the respective core particles, which they surround, so that there is produced a molding powder comprising core particles of the high point metal, each having a sheathing of the low melting point metal of desired thickness and in fused relation to the core, substantially as and for the purposes set forth. No. 2,273,832. Elvin P. Carney to Metals Disintegrating Co., Inc.

Method of preparing powdered titanium metal comprising heating titanium tetrachloride with sodium in a closed vessel in the presence of a minor quantity of a material taken from the class consisting of titanium dioxide, titanium nitride and titanium cyanonitride, and crushing the resulting product to the form of a powder. No. 2,273,834. George F. Comstock and Viatcheslav V. Efimoff to The Titanium Alloy Mfg. Co.

Method hardening metal surfaces. No. 2,274,005. Albert E. Shorter to The Linde Air Prods. Co.

Process for producing extruded nickel electroplating anodes. No. 2,274,056. George F. Geiger to The International Nickel Co., Inc.

Plating bath for semibright nickel deposition. No. 2,274,112. Andrew Wesley and Jay W. Carey to The International Nickel Co., Inc.

Process for purification of impure beryllium containing magnesium as well as other metallic impurities which comprises treating the impure beryllium in subdivided form with dilute nitric acid at a temperature not exceeding 60°C. No. 2,274,237. Gustav Jaeger, Neu-Isenburg and Alfred Rudert to Chemical Marketing Company, Inc.

Flux for braze or bronze welding which by proximate analysis is comprised predominantly of B_2O_3 and SiO_2 and contains of the sum of these ingredients 70%-98% B_2O_3 and 2%-30% SiO_2. No. 2,274,637. Robert M. Rooke and Frederick C. Saacke to Air Reduction Co., Inc.

Aluminum base alloy of relatively high strength and ductility, comprising magnesium, zinc, magnesium silicide, one or more metals for hardening or grain refining, and the balance substantially all aluminum and minor impurities. No. 2,274,657. Walter Bonsack to The National Smelting Co.

Method forming chromium-containing layers on ferrous metal articles, which comprises packing the article in pieces of ceramic carrier

U. S. Chemical Patents

Off. Gaz.—Vol. 535, No. 4; Vol. 536, Nos. 1, 2—p. 340

material selected from the group consisting of porcelain and sillimanite charged with chromium chloride and admixed with pieces of ferr-chromum, and heating the mass to a temperature in the neighborhood of 900° to 1100°C. No. 2,274,671. Karl Daeves, Gottfried Becker and Fritz Steinberg.

Soldering alloy highly resistant against tarnishing essentially comprising 25% to 85% of gold, 2% to 20% of palladium, 5% to 30% of copper, 3% to 25% of cadmium, 0.5% to 20% of silver, and 0.1% to 5% of zinc, said gold, palladium, copper, cadmium, silver and zinc constituting substantially all of the alloy. No. 2,274,863. Josef Leuser.

Method producing smooth, bright adherent coatings of tin and alloys predominantly of tin, on iron and steel strip. No. 2,274,963. Edward W. Hopper to Crucible Steel Co. of America.

Aluminum-beryllium alloy. Process for improving physico-mechanical properties. No. 2,275,070. Carlo Adamoli to Perosa Corp.

Process preparing Bessemer steel for the production of seamless tubes. No. 2,275,088. Peer D. Nielsen to National Tube Co.

Method of carburizing. No. 2,275,133. Ernest F. Davis to Borg-Warner Corp.

Process for improving properties of precipitation hardenable alloy consisting 0.2% to 3% zirconium with the remainder copper which comprises fully precipitation hardening said alloy, superimposing a condition of strain upon the precipitation hardened alloy and thereafter aging the alloy at a temperature below that which effects any recrystallization in the alloy and below the temperature employed in precipitation hardening said alloy. No. 2,275,188. Richards H. Harrington to General Electric Co.

Copper wire having a smooth, glossy continuous flexible coating tightly adhering thereto comprising a superpolyamide modified with 10 to 40% by weight shellac based on the superpolyamide. No. 2,275,198. Winton I. Patnode and William J. Scheiber to General Electric Co.

Rustproof Metal material and process. No. 2,275,223. Robert H. Hardoen.

Paints, Pigments

Method of making a stable, opaque, white lead aluminate pigment. No. 2,273,825. Louis E. Barton.

Method making colored granules which consists in first providing serpentine granular base material, then applying to the granules a liquid coating of sodium silicate having therein a coloring pigment, and finally heating said granules thus coated to a temperature sufficiently high to react said coating in situ with the serpentine base material and produce on said granules a hard insoluble colored exterior coating. No. 2,273,827. Milton R. Beasley to Bird & Son, Inc.

Method coating granules of the class described which consists in first coating the same with finely powdered serpentine, then applying to the granules thus coated an aqueous coating of sodium silicate, and finally heating said granules to a temperature sufficiently high to react said coatings in situ inter se and produce on said granules a hard, insoluble, weather-proof non-blooming exterior coating. No. 2,273,874. Edwin M. Lines to Bird & Son, Inc.

Production of finely divided pigment substances. No. 2,274,521. Charles E. Berry to E. I. du Pont de Nemours & Co.

Wet-milling method of producing leafing copper bronze pigment which consists in milling copper particles so as to reduce them to flake form, in a mill with a liquid hydrocarbon solvent carrying a leafing agent in solution, while maintaining in the mill an atmosphere free from oxygen and a temperature not lower than about 60°C. but below the point at which boiling occurs in the solvent substantially as set forth. No. 2,274,766. Othon A. Ziehl to Metals Disintegrating Co., Inc.

Fine-textured wrinkling enamel comprising an inert paste consisting of grinding vehicle and pigment selected from group consisting of asbestine and mixture of magnesium carbonate with diatomaceous earth, a color pigment and a cooked wrinkling varnish base comprising the following formula: modified phenol aldehyde resin 100 lbs.; a drier selected from group consisting of lead acetate and linoleate 5 to 9 lbs.; raw China-wood oil 5 to 25 gal.; vegetable drying oil selected from group consisting of bodied linseed oil, bodied perilla oil and bodied oiticica 2 to 20 gal.; solvent naphtha 8 to 10 gal.; and toluol 18 to 25 gal.; said inert paste imparting the fine wrinkle qualities to resulting finished enamel. No. 2,275,239. William A. Waldie to New Wrinkle, Inc.

Petroleum

Process for removing impurities from a contaminated or used mineral substance of the class consisting of mineral oils and mineral waxes. No. 2,273,846. Russell P. Dunmire to The Buckeye Labs. Inc.

Improved mineral oil composition comprising a viscous mineral oil fraction normally subject to deterioration under oxidizing conditions and in admixture therewith a minor proportion, sufficient to retard said deterioration of an N-phenyl phenylene diamine. No. 2,273,862. Lyle A. Hamilton and Everett W. Fuller to Socony Vacuum Oil Co., Inc.

Process regenerating catalysts capable of promoting hydrogenating reactions so as to restore their hydrogenating ability which comprises subjecting the catalyst to at least one sequence of oxidizing and reducing steps above 700°F. and thereafter subjecting the catalyst to at least one sequence of oxidizing and reducing steps below 700°F. No. 2,273,864. Eugene J. Houdry to Houdry Process Corp.

Process of desalting petroleum. No. 2,273,915. Frank E. Wellman.

Improved drilling mud comprising basic dye positive colloid drilling mud to which has been added a modicum of material selected from the group consisting of starch, wheat gluten and acid casein. No. 2,273,925. Donald C. Bond and Charles W. Botsford to The Pure Oil Co.

Continuous method of hydrocarbon oil conversion in which the conversion is brought about in the vapor phase in the presence of and by the action of a solid contact material or agent in divided from disposed in a reaction chamber maintained under superatmospheric pressure. No. 2,274,003. Bruce Sheppard to Petroleum Conversion Corp.

Method preparing a lubricant which comprises mixing with fatty body a small amount of material selected from the group consisting of phosphorus and phosphorus compound capable of reacting with said fatty body, adding sulfur halide to the mixture while maintaining the temperature below that at which appreciable polymerization occurs and subsequently heating the mixture to reaction temperature for a sufficient period of time to complete the reaction between the reagents. No. 2,274,022. Norman D. Williams to The Pure Oil Co.

Lubricant comprising mineral lubricating oil and between 0.1 and 5% by volume of sulfurized and phosphorized fatty material. No. 2,274,025. John S. Yule to The Pure Oil Co.

Process for the segregation of petroleum oils into their relatively more aromatic and into their relatively more paraffinic constituents. No. 2,274,030. George T. Atkins, Jr. to Standard Oil Development Co.

Process for selective oxidation or dehydrogenation of petroleum hydrocarbons. No. 2,274,204. Herman B. Kipper.

Compounded mineral oil. No. 2,274,291. James O. Clayton, Bruce B. Farrington and Robert L. Humphreys to Standard Oil Co. of California (a corp. of Del.).

Compounded oil. No. 2,274,302. Lloyd H. Mulit to Standard Oil Co. of California, (corp. of Del.).

Lubricating composition. No. 2,274,305. Theron P. Remy.

Process of refining mineral oils. No. 2,274,373. Arthur L. Lyman to Standard Oil Co. of California (corp. of Del.).

Lubricating oil composition. No. 2,274,617. Theron P. Remy.

Core oil. No. 2,274,618. Theron P. Remy.

Vapor phase isomerization of hydrocarbons. No. 2,274,624. Frank M. McMillan to Shell Development Co.

Nitro-type ignition promotor for diesel fuels. No. 2,274,629. Carleton Ellis to Standard Oil Development Co.

Process of preparing nitrohydroxyhydrocarbons from hydrocarbons. No. 2,274,630. Carleton Ellis to Standard Oil Development Co.

Method making a hydrocarbon conversion catalyst which comprises treating amalgamated aluminum with a dilute solution of acetic acid containing chromic acid, heating the resulting solution and drying the product. No. 2,274,633. Edgar C. Pitzer and Llewellyn Herard to Standard Oil Co.

Method converting hydrocarbon oils which comprises subjecting said oils at conversion temperature to action of a solid hydrocarbon conversion catalyst of great physical strength and high activity prepared by coagulating with an electrolyte a stable alumina sol resulting from the action of water on amalgamated aluminum metal thereby producing a firm, substantially transparent vibrant gel, separating the resulting gel from the solution and drying the gel to produce the desired catalyst in the form of a hard, granular, translucent solid material. No. 2,274,634. Llewellyn Heard to Standard Oil Co.

Liquid fuel for compression ignition engines containing a small quantity of trichloronitro methane. No. 2,274,665. Louis A. Clarke to The Texas Co.

Improved Diesel fuel comprising a hydrocarbon fuel oil containing a minor proportion of a compound selected from the group consisting of dichloro dinitro methane, dichlorotetranitro ethane and tetrachloro dinitro ethane, sufficient to decrease the ignition delay period of the fuel, improve its cold starting ability and decrease its tendency to deposite carbon and carbonaceous material in the motor combustion chamber. No. 2,274,666. Louis A. Clarke, Ernest F. Pevere and Wilfred N. Meyer to The Texas Co.

Lubricating grease comprising a lithium soap and a lubricating oil from the class consisting of mineral and vegetable oils, said lithium soap being present in quantities sufficient substantially to thicken the oil. No. 2,274,673. Clarence E. Earle.

Lubricating composition comprising at least one substance from the group consisting of chlorinated diphenyl and chlorinated diphenyl oxide and lithium soap of an average molecular weight of 277 sufficient in quantity substantially to thicken said diphenyl. No. 2,274,674. Clarence E. Earle.

Lubricating composition, comprising a lithium salt of an acid chosen from the group consisting of ethyl butyric ethyl hexoic and caproic acids and an oil from the group consisting of mineral oil and non-drying vegetable oil, the said salt being present in quantities between 4% and 40%. No. 2,274,675. Clarence E. Earle.

Lubricating compositions, comprising a lithium salt of an acid from the group consisting of acetic and butyric acids and an oil from the group consisting of mineral and non-drying vegetable oils, said salt being present in quantities of from 4% to 40%. No. 2,274,676. Clarence E. Earle.

Recovery of higher oxygen-containing organic compounds from crude oils obtained by the catalytic hydrogenation of carbon oxides. No. 2,274,750. Hans Soenksen and Herbert Grasshof to William Ellyson Currie.

Process forming branched chain paraffinic hydrocarbons having high anti-detonating characteristics and suitable as motor fuel, which comprises interacting isoparaffinic hydrocarbons having less than seven carbon atoms per molecule with ethylene in the presence of a catalyst comprising strong sulfuric acid and a modifying agent selected from the class consisting of the phosphates, sulfates, chlorides, nitrates, acetates and oxides of cadmium zinc, mercury, copper, silver and barium. No. 2,274,858. William H. Bradley to Union Oil Co.

Process treating contact catalyst capable of promoting a catalytic reaction at an operating temperature substantially below 800°C. and which displays an induction period at the beginning of use for promoting said catalytic reaction said catalyst being otherwise ready for use in said catalytic reaction. No. 2,274,988. Maryan P. Matuszak to Phillips Petroleum Co.

Stabilized stringy adherent grease composition comprising a hydrocarbon lubricating oil between 5% and 30% of a grease-forming soap of a metal selected from the group consisting of sodium, calcium, barium and aluminum, and between 0.01% and 5% of a mixture of polyisobutylene of over 30,000 molecular weight and an oil soluble high molecular weight linear acrylic polymer which in 2.8% solution by weight in tetrahydronaphthalene shows a viscosity of over thirty times more than that of water at 20°C., the amount of acrylic polymer being between 10% and 60% by weight of the total polymer mixture. No. 2,275,123. John C. Zimmer and Arnold J. Morway to Standard Oil Development Co.

Process for recovery of diolefins from hydrocarbon mixtures containing the same, which comprises contacting a hydrocarbon mixture containing a diolefin with a clear solution of a cuprous salt and a water-soluble organic nitrile, and recovering the diolefins from the clear solution of the cuprous salt and water-soluble nitrile by known methods. No. 2,275,135. Egi V. Fasce to Standard Oil Development Co.

U. S. Chemical Patents
Off. Gaz.—Vol. 535, No. 4; Vol. 536, Nos. 1, 2—p. 340

U. S. Chemical Patents

Off. Gaz.—Vol. 535, No. 4; Vol. 536, Nos. 1, 2—p. 341

High compression spark-ignition motor fuel composed substantially of gasoline hydrocarbons in a major proportion blended with an octane number improving amount of 2 to 15% by volume of a dialkyl phenol wherein a methyl group is one of the positions ortho and meta to the hydroxy group and a branched alkyl group containing 3 to 5 carbon atoms, para to the hydroxy group, said dialkyl phenol having a melting point below 40°F. and a boiling point within the range of about 395°F. to 475°F. No. 2,275,175. Gould H. Cloud to Standard Oil Development Corp.

Method cracking hydrocarbon oils which comprises subjecting said oil while at cracking temperature to the action of synthetic silica-alumina gel catalyst containing major portion of silica and a minor portion of alumina and a small amount but not more than about 1% of tin oxide and keeping said oil in contact with said catalyst for a period sufficient to obtain a substantial amount of cracking. No. 2,275,176. Gerald C. Connolly to Standard Oil Development Co.

Process recovering iso-octane from excess hydrogen-containing gas used in the hydrogenation of iso-octenes to iso-octanes which comprises contacting said excess gas containing iso-polymers boiling in the approximate range of 300-400°F., and subjecting said used absorption oil to distillation to separate therefrom absorbed iso-octane. No. 2,275,178. Ernest N. Hague to Universal Oil Products Co.

Process converting olefinic and aromatic hydrocarbons into more saturated hydrocarbons which comprises subjecting the hydrocarbon material to hydrogenation in the presence of metallic copper and iron oxide. No. 2,275,181. Vladimir N. Ipatieff and Ben B. Corson to Universal Oil Products Co.

Process manufacturing catalysts which comprises mixing a phoshoric acid with a siliceous material, calcining the mixture at a temperature of at least 600°F., then steaming the mixture at a temperature not substantially above 600°F., and treating the steamed mixture with a substantially dry inert gas at a temperature in the approximate range of 400-600°F. No. 2,275,182. Vladimir N. Ipatieff and Raymond E. Schaad to Universal Oil Products Co.

Process reactivating a mass of contact material having deposited thereon deleterious carbonaceous materials. No. 2,275,184. Lev A. Mekler to Universal Oil Products Co.

Refining crude tall oil compositions comprises contacting a petroleum hydrocarbon solution of a crude tall oil composition with an organic solvent for removing odoriferous and coloring material therefrom said solvent being immiscible with said tall oil solution and selected from the group consisting of ethylene chlorhydrin, α dichlorhydrin, β dichlorhydrin, ethylene glycol, diethylene glycol, diethylene glycol monomethyl ether, diethylene glycol monoethyl ether, ethylene glycol monophenyl ether and mesityl oxide and separating the organic solvent from the tall oil solution. No. 2,275,186. Ernest Segessemann to National Oil Products Co.

Lubricant comprising a mineral lubricating oil and small amount of cyclohexylamine naphthenate. No. 2,275,264. John J. Musselman and Herman P. Lankelma to The Standard Oil Co.

Improved process for the production of a motor fuel having a low volatility and a high octane number. No. 2,275,377. Frederick E. Frey to Phillips Petroleum Co.

Resins, Plastics

Method of making polystyrene material suitable for molding which comprises polymerizing styrene to a polystyrene having a molecular weight exceeding 40,000 and treating the polymerized styrene by mechanical working to reduce methanol soluble components to less than 3% of the material. No. 2,273,822. Ivey Allen, Jr. to Union Carbide and Carbon Corp.

Catalytic conversion of ureaformaldehyde resins. No. 2,274,447. Theodore S. Hodgins and Almon G. Hovey to Reichhold Chemicals, Inc.

Derivatives of resins and their preparations. No. 2,274,551. William O. Kenyon, Louis M. Minsk and George P. Waugh to Eastman Kodak Co.

Polyvinyl halide. No. 2,274,555. Archie B. Japs to The B. F. Goodrich Co.

Quick-setting vinyl compositions. No. 2,274,616. James W. Raynolds to The Raolin Corp.

Co-polymer having a molecular weight above 1500 prepared by polymerizing at a temperature below 0°C. in the presence of an active halide polymerization catalyst a mixture of an aliphatic olefine having more than two carbon atoms, and a different reactive mono-olefinic hydrocarbon capable of polymerization and containing a cyclic nucleus said materials constituting the sole reactants. No. 2,274,749. William H. Smyers to Standard Oil Development Co.

Polyamides and process for their preparation. No. 2,274,831. Julian W. Hill to E. I. du Pont de Nemours & Co.

In manufacture of decorative laminated products the method which comprises: adding small per cent of fluorescent dye to a urea formaldehyde varnish and impregnating a fabric body sheet with said varnish and drying same: superposing said sheet on an opaque sheet which reflects both visible and ultra-violet light; placing a surface sheet impregnating with a urea formaldehyde varnish, over the body sheet; and consolidating the assembly under heat and pressure. No. 2,275,290. John F. Dreyer to The Formica Insulation Co.

Rubber

Resilient synthetic rubber composition resistant to swelling by gasoline and mineral oil, resulting from vulcanizing a mixture comprising polymerized chloroprene and a gasoline-soluble chlorinated paraffin wax. No. 2,273,983. Emil Ott to Hercules Powder Co.

Method producing rubber hydrochloride film which comprises casting rubber hydrochloride cement on a continuous surface, evaporating a part of the solvent from the cement while on said surface and thereby removing sufficient solvent to obtain a self-supporting film, removing the film from said surface, stretching the film to increase its area at least one hundred per cent and then removing the balance of the solvent. No. 2,274,150. Gordon C. Mack to Wingfoot Corp.

Age resisting rubber composition. No. 2,274,367. Joseph R. Ingram to Monsanto Chem. Co.

Method of preserving rubber and product obtained thereby. No. 2,274,368. Joseph R. Ingram to Monsanto Chem. Co.

Stable rubber hydrochloride. No. 2,274,588. William C. Calvert to Wingfoot Corp.

Preservation of semihard rubber compositions. No. 2,274,602. Ray O. Hendrix to The B. F. Goodrich Co.

Textiles

Process for coloration of cellulose acetate textile materials, which comprises mechanically impregnating the material with a solution of a water insoluble dye, which has an affinity for the cellulose acetate when applied from an aqueous dispersion in mixture of an organic liquid having a swelling action on the cellulose acetate and boiling below 90°C. with monochlorbenzene which constitutes from 10 to 45% of the total dye liquid and thereafter drying the material. No. 2,274,751. Percy F. C. Sowter and William S. Meals to Celanese Corp. of America.

Spinning solution for manufacture of low luster products comprising aqueous cellulosic solution having dispersed therein mixture of sulfonation product of material selected from class consisting of animal, vegetable and marine oils, fats and their respective fatty acids and fatty esters, the sulfonation product being characterized by having a moisture content of not more than 3.0% and an inorganic salt content of not more than 0.2% by weight and an oily delustering agent, the quantity of said sulfonation product based on the weight of the delustering agent being between 2.5% and 15% in said mixture. No. 2,275,199. Thomas A. Printon to National Oil Products Co.

Printing of textile fabrics. No. 2,274,544. Ivan Gubelmann to E. I. du Pont de Nemours & Co.

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Foreign Chemical Patents
Canadian, British—p. 70

Abstracts of Foreign Patents

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Those making use of this summary should keep in mind the following facts:

Belgian and Canadian patents are not printed. Photostats of the former and certified typewritten copies of the latter may be obtained from the respective Patent Offices.

English *Complete Specifications Accepted* and French patents are printed, and copies may be obtained from the respective Patent Offices.

In spite of present conditions, copies of all patents reported are obtainable, and will be supplied at reasonable cost.

This digest presents the latest available data, but reflects the usual delays in transportation and printing. Your comments and criticisms will be appreciated.

CANADIAN PATENTS

Granted and Published July 8, 1941.

Copper-lead alloy production by heating the constituents of the alloy together in a molten state in the presence of lithium until agitation of the molten metal occurs. No. 397,759. Harold Julius Ness.

Sulfur nitride manufacture by dispersing a quantity of sulfur chloride on more than its own weight of inert solid material and subjecting the so treated material to gaseous NH_3 at a rate and at a temperature low enough to convert substantially all the sulfur chloride to S_4N_4, NH_4Cl and S without formation of substantial quantities of other end products. No. 397,769. Carl F. Swinehart.

Aluminum coating process comprising immersing the aluminum or aluminum alloys to be coated in an electrolytic bath containing approximately 13% by weight of sulfuric acid. the alloy or metal being coated being utilized as the successive and alternate anode and cathode and being subjected in the bath to a flow of alternating current in successive stages beginning at approximately 9 to 12.5 volts intensity and increasing to approximately 24 volts at the conclusion of the process. No. 397,770. Fred Andrew Wales.

Copper base alloy comprising about 0.1-1.0% tin, about 0.05-0.5% silicon, about 0.05-0.5% manganese, and the balance substantially all copper. No. 397,772. The American Brass Company. (Cyril S. Smith and Ira T. Hook).

Straphanthus glucoside manufactured from strophanthus kombé by preparing an extract from the seed, rich in glucosides, dissolving this extract in a suitable solvent and treating this solution with an organic solvent non-miscible with water, separating the precipitation thus obtained, and repeating this operation several times until the new glucoside crystallizes out. No. 397,795. Chemical Works formerly Sandoz. (Arthur Stoll and Jany Renz).

Dustless starch grits manufacture from water suspension of starch. No. 397,796. Corn Products Refining Company. (William J. Lauterbach).

Cellulose derivative comprising benzyl cellulose and plasticizing quantity of at least one cyclohexylated phenyl ether wherein the average number of cyclohexyl substituents is from 1.5 to 6. No. 397,797. The Dow Chemical Company. (Shailer L. Bass, Toivo A. Kauppi and Frank B. Smith).

Alkali metal recovery from an alloy of said metal having a melting point not higher than about 100° C. comprising employing said alloy in the liquid state as anode in an electrolytic cell which contains as electrolyte a fused mixture of alkali metal hydroxide and alkali metal halide having a melting point below 300° C. No. 397,798. E. I. du Pont de Nemours & Company. (Harvey N. Gilbert).

Alkali metal production by electrolyzing an aqueous solution of an alkali metal compound with a mercury cathode to obtain dilute, non-homogeneous, substantially liquid alkali metal amalgam, flowing said amalgam from the zone of electrolysis with minimum agitation, cooling said liquid amalgam before mixing can occur sufficiently to precipitate a solid amalgam therein, and separating said solid amalgam from the cooled liquid amalgam and recovering alkali metal from said solid amalgam. No. 397,799. E. I. du Pont de Nemours & Company. (Harvey N. Gilbert).

Corrosion resistant steel comprising 15-35% chromium, 1-5% molybdenum, manganese in an amount not exceeding 3%, silicon in an amount not exceeding 3%, carbon in an amount not exceeding 0.35%, nitrogen in an amount not exceeding 0.5%, and columbium in an amount at least four times the carbon content but not exceeding eight times the carbon content by more than 1.5%, the remainder iron. No. 397,801. Electro Metallurgical Company of Canada Limited. (Russell Franks).

Lacquer composition comprising chlorine-containing rubber material. No. 397,805. Hercules Powder Company. (Arloe R. Olsen).

Zinc refining method comprising amalgamating a sheet or slab of impure zinc with mercury, dissolving the zinc from the sheet or slab by using the same as anode in an electrolytic cell and plating the zinc in the said cell on to a suitable cathode. No. 397,808. Hudson Bay Mining & Smelting Co. Limited. (Benjamin Morrison and George H. Kent).

Composite bearings composed of a tough, strong, corrosion resistant metal backing of a nickel-copper alloy and a bearing layer of silver-cadmium alloy bonded to said metal backing. No. 397,812. The International Nickel Company, Inc. (Paul E. Queneau and William A. Mudge).

Synthesis gas manufacture by catalytic conversion from hydrocarbon gas, steam and carbon dioxide at from 2200-1800°F. No. 397,817. The M. W. Kellogg Company. (George Roberts, Jr., Dustin W. Wilson, and Percival C. Keith, Jr.).

Molybdenite separation by flotation. No. 397,821. Minerals Separation North American Corporation. (Earle H. Brown and Carl F. Williams).

Petroleum plastic, translucent in thin layers, substantially free from asphaltenes, substantially solid at atmospheric temperature, substantially completely soluble in 86° A. P. I. naphtha, more than 75% insoluble in an equal volume acetone at 77° F., and having a temperature susceptibility lower than that of asphaltic resins. No. 397,846. Shell Development Company. (Alvin P. Anderson).

Cement burning or sintering process which comprises forming a porous layer of a mixture of the raw material and solid fuel, passing hot gases through the layer to dry and preheat the material, thereafter igniting the fuel, and passing further gas through the layer by which the burning sintering proper is carried on. No. 397,848. F. L. Smidth & Co. (Nikolai Ahlmann).

Electrolysis of alkali metal salt wherein the catholyte comprises liquid ammonia. No. 397,850. The Solvay Process Company. (Charles F. Silsby).

Absorption process for the separation of nitrogen peroxide from chlorine. No. 397,851. The Solvay Process Company. (Hermann A. Beekhuis, Jr.).

Preparing detergent aids by the method comprising reacting together acyclic polymers having a molecular weight above 100 and produced from gaseous olefins with phenols and an amount of a strong polybasic mineral acid sufficient to form acid derivatives of the resulting alkyl phenols, completely neutralizing the resulting product and separating therefrom the resulting salts of the sulfuric acid derivatives. No. 397,856. Standard Oil Development Company. (Louis A. Mikeska).

Refractory composition comprising a refractory material and a zirconate of a metal taken from the group consisting of lithium, sodium, potassium, magnesium, calcium, barium, strontium and zinc. No. 397,864. The Titanium Alloy Manufacturing Company. (Charles J. Kinzie and Eugene Wainer).

Steel manufacture comprising the steps of producing in a blast furnace a charge of pig iron, refining said pig iron in an acid Bessemer converter, and refining the blown metal in a basic open hearth furnace, and the improvement comprising adding to the usual charge entering said blast furnace sufficient phosphorus- and manganese-containing slag material to introduce in said pig iron a manganese content exceeding 5% and a phosphorus content exceeding 0.7%. No. 397,873. United States Steel Corporation. (Clarence D. King).

Local anaesthetics of reduced toxicity and method for their manufacture. No. 397,877. Winthrop Chemical Company, Inc. (Otto Eisleb).

Textile coloring process including the step of adding diglycol laurate with the dyestuff. No 397,880. Camille Dreyfus. (Herbert Platt).

Dark dyeing textile material containing an organic derivative of cellulose comprising adding a diazotizable dyestuff base to the material, applying mineral acid thereto to form therein a mineral acid salt of the dyestuff base, diazotizing and coupling with a coupling component producing a dark color. No. 397,881. Camille Dreyfus. (George W. Seymour and Victor S. Salvin).

Dark dyeing textile material containing an organic derivative of cellulose comprising adding a diazotizable dyestuff base to the material, diazotizing the dyestuff base, washing the treated textile with water until the diazonium salt formed is hydrolyzed to the diazohydrate, and coupling with a coupling compound component producing a dark color. No. 397,882. Camille Dreyfus. (George W. Seymour and Victor S. Salvin).

Dark dyeing textile material by method including employing diazotizable dyestuff base. No. 397,883. Camille Dreyfus. (Ernest Thornton).

Drying cellulose acetate in particle form by squeezing out a part of the wetting liquid and then causing the acetate to pass through a confined space so that it substantially fills said space and at the same time gently agitating the cellulose acetate and passing a current of drying atmosphere through the cellulose acetate. No. 397,886. Camille Dreyfus. (Clifford I. Haney).

Laminated panel comprising a number of wood plies secured to each other by means of a water-resistant adhesive, and adhering to the outer surfaces of the panel, sheets of a composition having a basis of cellulose acetate. No. 397,887. Henry Dreyfus. (William Walker).

Battery paste retaining envelop comprising an outer layer of perforate hard rubber and an inner layer of soft sponge rubber. No. 397,889. International Latex Processes, Limited. (Eardley Hazell).

Foreign Chemical Patents
Canadian, British—p. 70

Foreign Chemical Patents

Canadian, British—p. 71

Butter manufacture comprising storing cream having a fat percentage of at least 40 for a considerable time at a temperature below —5° C., bringing the cream to a temperature and diluting the same to a fat percentage both suitable for churning and churning the tempered cream. No. 397,891. Naamlooze Vennootschap Linthorst-Koelhuis en IJsfabrieken. (Henricus A. Linthorst).

Polymerizing method for vinyl esters of organic acids comprising carrying out the polymerization in the presence of water and of a catalyst of the group consisting of per-acids and salts of per-acids. No. 397,896. (Werner Heuer and Hajo Eilers).

BRITISH COMPLETE SPECIFICATIONS

Accepted and Published October 9, 1940.

Polymeric amides. No. 526,942. E. I. du Pont de Nemours & Co., Inc.

Rubber tubes manufacturing method. No. 526,873. Firestone Tyre & Rubber Co., Ltd.

Unsized colored paper production. No. 526,674. Geigy Colour Co., Ltd. and J. Keaton.

Carbon sulfo selenide preparation. No. 526,743. Wingfoot Corporation.

Treatment of mixtures of wax-oil and wax-wax. No. 526,744. A. H. Schutte.

Explosive charges, detonators, and the like. No. 526,876. A. Price, W. Pryse and T. H. Henderson.

Vulcanizing accelerators comprising derivatives of hexamethylene-dithiocarbamic acid. No. 526,745. E. I. du Pont de Nemours & Co., Inc.

Luminescent material. No. 526,675. General Electric Co., Ltd.

Artificial resin manufacture. No. 526,877. Albert Products, Ltd.

Washing gases for the removal of impurities therefrom. No. 526,811. International Corporation, Ltd.

Sulfonamide (soluble aromatic) compounds manufacture. No. 526,747. Winthrop Chemical Co., Inc.

Hydrocarbon synthesis from carbon monoxide and hydrogen. No. 526,814. Naamlooze Vennootschap Internationale Koolwaterstoffen Synthese Maatschappij.

Drying process and apparatus for liquid material. No. 526,882. Borden Co.

Chocolate manufacture. No. 526,753. H. Schou.

Rustproofing of ferrous surfaces prior to painting or enameling. No. 526,815. S. T. Roberts and F. Taylor.

Treating metals such as zinc, zinc alloy, galvanized cadmium, and cadmium alloy surfaces for insuring paint and enamel adhesion. No. 526,816. S. T. Roberts and F. Taylor.

Process for dyeing wool and improved dyestuff preparations for use therein. No. 526,760. A. E. Everett and J. A. Wallwork.

Di-tocopherols manufacture. No. 526,884. Hoffmann-LaRoche & Co., A. G.

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Annealing metal alloys. No. 527,295. Electric Resistance Furnace Co., Ltd.

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Absorption of nitrogen oxides to form nitric acid. No. 527,037. Chemical Construction Corporation.

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Manufacture of impregnated paper. No. 527,043. Distillers Co., Ltd.

Manufacture of dyes and emulsions. No. 527,296. Kodak, Ltd.

Treatment of cereals preparatory to milling. No. 527,047. Wessanen's Koninklijke Fabrieken N. V.

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Catalytic heating apparatus. No. 527,114. Société Lyonnaise des Rechauds Catalytiques S. A.

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Apparatus for scouring, washing, and drying fabrics in their process of treatment. No. 527,127. E. G. Whiteley.

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